VOL. VIII JANUARY 1957 NO. 1

UNITED STATES ARMED FORCES MEDICAL JOURNAL

Published Monthly by
the Armed Forces Medical Publication Agency
Department of Defense

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UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON : 1957

THE PRINTING OF THIS PUBLICATION HAS BEEN APPROVED BY
THE DIRECTOR OF THE BUREAU OF THE BUDGET, 20 FEB. 1956

Foreword

The *United States Armed Forces Medical Journal* is the medium for disseminating information of administrative and professional interest to all medical personnel of the Department of Defense. The Assistant Secretary of Defense (Health and Medical) and the Surgeons General of the several services invite all medical officers, dental officers, Medical Service Corps officers, Nurse Corps officers, and officers of the Veterinary Corps of the Armed Forces, and the medical consultants of the Army, Navy, and Air Force to submit manuscripts for publication in this *Journal*.

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UNITED STATES ARMED FORCES
MEDICAL JOURNAL

Volume VIII | January 1957 | Number 1

TRANSIENT ATRIAL FIBRILLATION

A Frequent Occurrence in Apparently Normal Hearts

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THE OCCURRENCE of atrial fibrillation in seemingly healthy persons presents many interesting problems in determining its cause and treatment. In most instances any sizable number of individuals with atrial fibrillation can be separated without difficulty into two significantly dissimilar clinical groups —a large group with diseased hearts and a small group with anatomically normal hearts. Although it is now well known that atrial fibrillation, particularly the paroxysmal form, may occur in persons who show no other evidence of organic heart disease, the frequency with which this arrhythmia is observed in the selected and comparatively healthy military population is not generally realized.

Over 40 years ago Gossage and Broxton Hicks[1] focused attention upon the occurrence of atrial fibrillation in normal hearts when they reported the case of a young man who developed fibrillation with otherwise normal cardiac findings and who died 19 months later. Nearly two decades later Parkinson and Campbell[2] reported that 15 per cent of 200 patients with paroxysmal atrial fibrillation showed no signs of cardiac disease. Since then those familiar with this arrhythmia[3-7] have agreed that approximately 5 to 6 per cent of all atrial fibrillation occurs in normal hearts, the arrhythmia being transient or paroxysmal in about two thirds of the cases and established in the remainder.

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MATERIAL AND METHODS

Sixteen cases of transient atrial fibrillation were observed during a 30-month period in military personnel stationed within an overseas command. All individuals were men on active duty with United States military forces in Europe or North Africa during the period of observation. I cared for or saw in consultation one half of the group. The remaining eight cases were obtained from a review of medical records. Each patient was examined during one or more episodes of atrial fibrillation and the diagnosis confirmed by electrocardiographic tracings. In every case a careful evaluation was conducted in order to rule out organic diseases such as rheumatic fever or hypertension as possible causes. Roentgenograms of the chest, with or without cardiac fluoroscopy, were obtained in each case. Laboratory studies, including hemoglobin, red blood cell count, total white blood cell and differential count, urinalysis, and cardiolipin tests, were normal in all instances. In cases where hyperthyroidism was suspected, basal metabolism and protein-bound iodine determinations were performed with normal results. In a few other cases, a Master two-step test was accomplished to evaluate the possibility of coronary artery disease.

CASE REPORTS

Table 1 summarizes the findings in cases not discussed in detail. Only one person was over 35 years of age when the attacks began. The age at onset in five patients was 21 years or younger. Four selected case reports emphasize specific features of this condition.

Case 1. A 21-year-old airman was admitted to the hospital complaining that "my heart is falling out of joint." Further questioning elicited a 15-year history of a sudden, recurrent, oppressive, and aching precordial pain associated with palpitation and followed shortly by dyspnea. These attacks, which had begun at six years of age, were noted to be precipitated most often by physical exertion or emotional tension and excitement. They occurred at intervals from a few days to six months and were usually of a few minutes' duration, but one previous episode had lasted for 30 hours. During his military service the patient had been hospitalized twice previously with these attacks, but they subsided without specific therapy. On both occasions the precipitating factor was emotional tension associated with a fist fight while under the influence of alcohol.

On the present occasion, he had experienced a sudden onset of precordial discomfort, palpitation, and dyspnea immediately following an argument. Examination revealed a hyperkinetic, excited young man with a blood pressure of 128-116 mm Hg (systolic) and 76-66 mm Hg (diastolic). The apical rate was 128 per minute and the radial pulse 120 per minute. A total irregularity of rhythm and force of cardiac systole was

observed without other abnormal cardiac findings. The remainder of the examination was not remarkable. An electrocardiogram on admission revealed atrial fibrillation without other abnormalities. He was given 0.10 gram of Seconal (brand of secobarbital sodium) and placed on bed rest, and the rhythm returned to normal 30 minutes later. A repeat electrocardiogram was interpreted as entirely normal. Basal metabolism determination was plus 4. He was returned to duty three days later with the reassurance that he did not have cardiac disease and with the advice that he avoid fights and other emotional upsets.

He was followed as an outpatient and two months later he experienced paroxysmal palpitation for a few minutes following an argument with his supervisor. One month thereafter he again experienced an episode of marked cardiac irregularity immediately after becoming excited. This subsided after 20 minutes and as usual necessitated no specific treatment.

Case 2. A 34-year-old airman was hospitalized with complaints of palpitation, nausea, and vomiting for one day prior to admission while drinking excessively. During the preceding year the patient had noted transient episodes of palpitation occurring mostly at night, together with mild dyspnea and sharp, fleeting precordial pain unrelated to effort. He was known to be a very heavy drinker and smoked an average of 50 cigarettes per day.

At the time of admission the patient appeared acutely ill with a temperature of 98.6°F and a blood pressure of 130/85 mm Hg. His pulse was grossly irregular at 128 per minute, and respirations were 24 per minute. Examination was otherwise unremarkable except for a cardiac rate of 140 to 150 per minute with a grossly irregular rhythm. An initial electrocardiogram revealed atrial fibrillation of 140 to 160 per minute with no evidence of myocardial damage. Because of the severity of symptoms he was rapidly digitalized intravenously and eight hours later was asymptomatic, but the fibrillation still persisted at 80 per minute. He was maintained on oral doses of digitalis for the next six days, but the fibrillation continued with a slow ventricular rate. He was then given quinidine orally, which established a normal sinus rhythm. All laboratory investigations, including cardiac fluoroscopy and basal metabolic rate, revealed no evidence of organic heart disease.

Quinidine was gradually decreased over a 10-day period, following which he was discharged asymptomatic without medication and was advised to avoid tobacco and alcohol. One month later he complained of mild palpitation; fibrillation had returned at a rate of 130 per minute. He had resumed smoking and drinking in the interim. The arrhythmia was converted to sinus mechanism after 1.2 grams of quinidine given orally. Again quinidine was gradually decreased, and on return to the United States six weeks later he was asymptomatic without therapy.

Comment. These cases illustrate the importance of emotional tension and acute alcoholism as precipitating factors and point

TABLE 1. *Data on cases of transient atrial fibrillation**

Case number	Age at onset	Age when first examined	Number of attacks	Duration of attacks	Possible precipitating factors	Treatment	Follow-up data
5	20	20	Several	5 min to 12 hr	Acute alcoholism and exercise	Phenobarbital	No recurrence during 6-mo period
6	32	32	1	Few hours	Heavy smoker	Quinidine abolished episode	No recurrence in 4 mo
7	34	36	3 or 4	1 to 6 hr	Alcohol, heavy meals, nervous tension, smoked 2 to 3 packs cigarettes daily	Episodes ceased spontaneously	Unavailable
8	21	21	1	14 hr	Physical exertion	Cedilanid intravenously abolished episode	No recurrence in 2 mo
9	48	48	Several	1 to 2 hr	Smoked 2 packs cigarettes daily	Episodes ceased spontaneously	Asymptomatic recurrence noted on annual physical examination 16 mo later
10	26	29	Several	Few hours to 7 days	Upper respiratory infection and airplane flight	Quinidine abolished episodes	Recurrence 6 wk after original attack. Returned to duty on maintenance quinidine

TABLE 1. *Data on cases of transient atrial fibrillation**—Continued

Case number	Age at onset	Age when first examined	Number of attacks	Duration of attacks	Possible precipitating factors	Treatment	Follow-up data
11	28	28	1	Few hours	Influenza immunization; heavy drinker, (epilepsy?)	Episode ceased spontaneously	Normal examination 4 mo later
12	17	19	Innumerable	5 min to 3 hr	Usually with emotional upsets	Episodes ceased spontaneously	Transient paroxysms continue but are not incapacitating
13	33	35	Several	Few min to 5 days	Exertion, fatigue, nervous tension	Episodes ceased spontaneously or with quinidine	Attacks continued over 18-mo period at intervals from weeks to several months with no suppressive quinidine therapy
14	23	23	1	Several hours	None	Quinidine abolished episode	No recurrence in 6 mo
15	20	20	1	30 hrs	Acute alcoholism	Quinidine abolished episode	No recurrence in 6 wk
16	27	27	1	3 days	Nervous tension and anxiety	Digitalis plus quinidine abolished episode	No recurrence in 3 mo

*Cases 1 through 4 are discussed in detail under "Case Reports."

out the variability in frequency and duration of attacks. The repeated spontaneous termination of attacks in the first patient is contrasted with the longer duration of attacks requiring specific therapy in the second.

Case 3. A 35-year-old Air Force captain with 16 years of active duty was admitted to the hospital with the chief complaints of cough, diffuse chest soreness, and exertional dyspnea of one week's duration.

This officer had been in excellent health during his entire life until about one week prior to admission, at which time he developed mild exertional dyspnea and cough which he attributed to a "cold." Shortly thereafter, he noticed a constant, aching chest discomfort without associated fever, chills, or sweating. For about two weeks prior to admission he had noted a gradual gain in weight associated with slowly increasing ankle swelling. Two nights prior to admission he experienced an episode of paroxysmal nocturnal dyspnea. The night before admission he was orthopneic and rested in a chair for the entire night. At no time had he been aware of any palpitation or irregularity of heart action.

Physical examination on admission revealed an acutely ill, orthopneic white male. His oral temperature was 99°F; weight, 196 pounds; and blood pressure, 105/85 mm Hg. There was slight neck vein distention. Cardiac examination revealed a widening of the left heart border 2 cm beyond the midclavicular line with a soft, systolic, blowing grade II mitral murmur. There was total irregularity of rhythm and force of cardiac systole. The apical rate was 160 and there was a pulse deficit of 80 per minute. The breath sounds were equally suppressed bilaterally, and crackling inspiratory rales were audible over the lower two thirds of both lung fields. The liver was enlarged 4 cm below the costal margin in the midclavicular line, and there was a 2 to 3 plus pitting edema of the lower extremities. An electrocardiogram confirmed the clinical diagnosis of atrial fibrillation, and a roentgenogram of the chest revealed widening of the cardiac silhouette with bilateral pulmonary edema.

The patient was placed on bed rest with his head elevated to 70°, given a low-sodium diet, Mercuhydrin (brand of meralluride sodium), and ammonium chloride, and rapidly digitalized with 1.6 mg of Cedilanid (brand of lanatoside C) given in divided doses of 0.8 mg three hours apart. Eight hours after admission his apical rate had slowed to 84 per minute, and there was no pulse deficit. He was less orthopneic, but the left cardiac border was still widened 2 cm beyond the midclavicular line, and a short, soft, blowing grade I systolic mitral murmur was still present. Diuresis was accomplished rapidly, and by the third day his weight had decreased to 166 pounds and the pulmonary congestion had disappeared. The heart murmur was no longer audible, but the atrial fibrillation was still present at a ventricular rate of 70 to 80 per minute. He was kept on 0.2 mg of digitoxin daily and given 0.2 gram of quinidine every six hours. Twenty-four hours later the rhythm had converted to

normal and he was essentially asymptomatic. A repeat roentgenogram of the chest on the fourth day following admission revealed marked decrease in the cardiac dilatation and a clearing of the pulmonary congestion.

On two occasions, once two days later and again seven months later while he was an outpatient, atrial fibrillation recurred without symptoms. On both occasions a normal sinus rhythm was restored after the dosage of quinidine was increased. He was returned to military duty and maintained on quinidine.

Comment. This patient's condition is a very interesting example of a prolonged attack of fibrillation resulting in pronounced congestive heart failure. It is notable that he never had symptoms such as palpitation, referable directly to the irregular and rapid cardiac rate. The original symptoms were those of congestive heart failure. He was again asymptomatic seven months later when re-examination revealed a recurrence of the fibrillation.

Case 4. A 35-year-old Air Force captain was seen in consultation because of recurrent paroxysmal atrial fibrillation and anginal-type pain of one year's duration. Prior to the onset of the present complaints, he was in excellent health. The patient used no tobacco and drank only occasionally. He was accustomed to eating heavily and drinking several cups of coffee daily.

He first consulted a doctor when he experienced moderately severe, pressure-type retrosternal pain which radiated to the left side of the neck and left arm and lasted for six hours. A diagnosis of probable coronary insufficiency was made on the basis of the history, clinical findings, and serial electrocardiograms. Shortly after admission, he was noted to have transient episodes of atrial fibrillation which recurred both at rest and with mild exertion, and was associated at times with anginal-type pain. These episodes subsided spontaneously or with small doses of quinidine. The results of a basal metabolic rate, serum cholesterol, upper gastro-intestinal barium study, a roentgenogram of the gallbladder, and cardiac fluoroscopy were normal.

He was placed on a regimen of 0.2 gram of quinidine four times a day and returned to duty after nine weeks. Four months thereafter quinidine was discontinued, and physical examination was normal except for moderate obesity (weight, 210 pounds). While carrying heavy suitcases two weeks later he experienced a sudden recurrence of palpitation with total irregularity of the heart, followed in a few minutes by anginal-type pain. These symptoms subsided about five hours after onset, following self-medication with quinidine, phenobarbital, and aspirin.

One month later, while falling asleep, he experienced two or three "heavy heartbeats" followed immediately by tight chest discomfort and onset of total cardiac irregularity. On this occasion fibrillation continued for 16 hours, until admission to the hospital. Physical examination revealed a moderately ill, apprehensive man with atrial fibrilla-

tion, an apical rate of 140 to 150 per minute, and a pulse deficit of 15 to 20 beats per minute. Blood pressure was 106/76 mm Hg; weight, 206 pounds; height, 5 feet 9 inches. The fibrillation terminated with bed rest alone shortly after admission. Subsequent electrocardiograms revealed a normal sinus rhythm with occasional ventricular ectopic beats. A double Master two-step test on two occasions produced no electrocardiographic changes indicative of myocardial ischemia. Total serum cholesterol was 195 mg per 100 ml. A fasting blood sugar and an oral glucose tolerance test were normal. Following discharge from the hospital he was continued on a reducing diet and 0.2 gram of quinidine four times a day. When last seen he had lost 20 pounds by dieting and was continuing on active duty as a personnel officer.

Comment. This patient illustrates the problem of eliminating organic heart disease as a cause of atrial fibrillation when chest pain is a presenting complaint. Although coronary disease cannot be absolutely ruled out, this officer was an introspective, anxious individual, and the chest pain as well as the fibrillation was believed to be of functional origin.

DISCUSSION

All of these patients, with the possible exception of case 4, fall into the category of patients previously described as having "benign," "idiopathic," "functional," or "uncomplicated" atrial fibrillation. This arrhythmia occurs commonly in apparently healthy young individuals. In my experience during this period, atrial fibrillation was observed much more frequently in normal persons than in individuals with abnormal hearts. This is readily understandable since persons with organic heart disease as a cause of fibrillation are not often serving on active military duty. Master and Eichert[7] previously emphasized the frequency with which they observed "functional paroxysmal auricular fibrillation" in U. S. Navy personnel during World War II.

It should be emphasized that atrial fibrillation is a physical diagnostic sign and not a disease per se. Whenever fibrillation occurs one is obliged to evaluate all possible causes, both cardiac and extracardiac, including rheumatic heart disease, hypertension, hyperthyroidism, coronary disease, infection, drugs and drug sensitivity, toxic agents, metabolic imbalance, trauma, fatigue, overexertion, and neurogenic and emotional factors. The primary problem is to ascertain whether the fibrillation is a secondary manifestation of underlying heart disease or whether it is a primary functional disorder occurring in an otherwise normal heart.

A most careful examination is necessary to rule out organic heart disease in patients with "functional" transient fibrillation before regarding such patients as normal. Careful auscultation is necessary to exclude the presence of mitral stenosis, and roentgenographic examinations should be employed to assure that there

is no abnormality of the cardiac silhouette or abnormal prominence of the left atrium. The basal metabolic rate, protein-bound iodine, and radioactive iodine uptake should be determined if hyperthyroidism is suspected. Ballistocardiography, although not performed in this series, is a valuable adjunct to electrocardiography in uncovering otherwise undetectable evidence of cardiac disease. Selinger and Levin[8] reported abnormal ballistocardiograms in individuals with paroxysmal atrial fibrillation who showed no apparent evidence of heart disease by all other methods of evaluation.

That atrial fibrillation occurs in normal hearts has been proved repeatedly at post-mortem examination.[3,9,10] Atrial fibrillation may be a physiologic disturbance of impulse formation and conduction and not necessarily a pathologic phenomenon. There is no pathologic change in the heart characteristic of auricular fibrillation.[10]

The factors which may disturb physiologic function and contribute to the production of atrial fibrillation in apparently normal hearts are many drugs, chemicals, alcohol, tobacco, and even carbon monoxide.[3,6,11] Friedlander and Levine[5] advocated the theory of a "trigger" mechanism of neurogenic origin as an important basis for the inception of such attacks. This explanation would certainly seem reasonable for a large percentage of the cases observed in this group. Hanson and Rutledge[12] reported that attacks of paroxysmal atrial fibrillation were associated with a psychogenic or functional element in 70 per cent of their cases. In the present series, emotional strain and/or alcoholism were precipitating factors in half of the patients.

As seen in this group of cases, the symptoms associated with paroxysmal atrial fibrillation may vary from total unawareness of its presence to advanced incapacitation from congestive heart failure. Wolff,[13] in a detailed analysis, reported 28 of 81 cases of paroxysmal atrial fibrillation to be asymptomatic, and while most authors agree that palpitation is the most common complaint, less frequently observed symptoms are faintness, dyspnea, and weakness. Syncope, although uncommon, has been reported to be caused by associated hypotension resulting from a very rapid heart rate or, more probably, from temporary cardiac arrest just preceding or following the paroxysm of fibrillation.[14]

Very interesting is the association between angina pectoris and paroxysmal fibrillation. Wolff[13,15] reported angina to be induced by paroxysmal fibrillation in several patients, the majority of whom also experienced angina on effort. However, most authors[16-19] agree that atrial fibrillation and angina due to coronary disease rarely occur together. Transient fibrillation is frequently found during early acute coronary thrombosis[13,19,20] associated

with congestive failure, secondary to arteriosclerotic heart disease.[11,16] Case 4 is interesting in this regard because the patient experienced anginal-like pain in association with transient atrial fibrillation. Also, the pain occurred both at rest and on exertion and was relieved only irregularly by nitroglycerin. Although in this case a double Master two-step test was negative on two occasions, it is feasible that the chest pain and the fibrillation were manifestations of coronary artery insufficiency. On the other hand, the order in which symptoms appeared in this patient suggests that the angina may be caused by the paroxysm of fibrillation itself, as described by Wolff.[15]

Course and prognosis

Although it is possible for paroxysmal rapid heart action to cause death due to heart failure, embolism, vascular collapse, renal failure, or cardiac arrest from conversion to ventricular fibrillation or asystole, this rarely occurs in actual cases of paroxysmal atrial fibrillation unassociated with organic heart disease. It can be seen that the course of transient atrial fibrillation has no set pattern. The majority of these patients continued to experience recurrent attacks. Attacks may also become less frequent and of shorter duration, or may cease entirely, either spontaneously or with drug therapy.[12,21] In about 10 per cent of cases,[2] episodes of paroxysmal fibrillation may assume a progressive nature with eventual establishment of a permanent fibrillation.

Although persistent atrial fibrillation is not often damaging, Wolff[13] and Phillips and Levine[22] emphasized that this arrhythmia produces abnormal circulatory dynamics resulting in cardiac enlargement and Brill[23] and Phillips and Levine reported cases similar to case 3 of this series, in which frank congestive heart failure resulted from atrial fibrillation alone. The latter stated that this is a reversible type of heart failure and advocated conversion to normal sinus rhythm with quinidine (plus digitalis if necessary) to prevent irreversible cardiac enlargement and chronic congestive failure.

Authors[2,6,12,24,25] have commented upon the good prognosis and the benign nature of transient atrial fibrillation when no organic heart disease exists. There is a favorable prognosis for patients under 40 years of age at onset and whose attacks continue intermittently for more than two years.[24] Willius and Dry[25] found the death rate in a series of 59 patients to be similar to that of the general population. The patients reported here, with one possible exception, can expect a favorable future.

The capability of these individuals to perform satisfactory military duty was not appreciably impaired by the transient episodes of fibrillation. It therefore seemed reasonable to allow them

to continue on active duty. Although Master and Eichert stated that "patients with functional paroxysmal auricular fibrillation should be discharged from the Navy or at least placed on limited duty ashore," and Englefeldt[26] maintained that such persons should be given restricted civilian jobs, the numerous articles on this subject almost universally agree that this cardiac arrhythmia is harmless and that it seems unwarranted to limit these persons in their activities and thus contribute to an iatrogenic cardiac disability.

Therapy

These patients should be fully informed regarding the benign nature of their disability and urged to eliminate those precipitating factors which are associated with the attacks of fibrillation. In one third of this group no specific cardiac therapy was needed, the episodes spontaneously subsiding.

Two drugs, quinidine and digitalis, are widely used in the treatment of atrial fibrillation. However, the patient with infrequent episodes of transient fibrillation of short duration is not in need of such therapy. A rapid ventricular rate, particularly if over 150 per minute, is the most positive indication for definitive therapy, since congestive failure may ensue, vascular collapse may develop, and the liability of embolism is increased.

The young patient with atrial fibrillation is an ideal subject for quinidine therapy, which should be administered to all patients who do not revert to normal sinus rhythm within 24 hours, provided, of course, there is no sensitivity to the drug. If congestive heart failure has supervened, the patient should first be rapidly digitalized to control the rapid ventricular rate, eliminate the pulse deficit, and improve the myocardial contractility. Most cardiologists agree that quinidine should not be used before compensation is restored because attempts at conversion under such circumstances may result in a more pronounced and uncontrollable tachycardia or embolism. In many instances the fibrillation will revert to normal sinus rhythm after digitalization has restored compensation. If not, quinidine should then be given to convert the arrhythmia. After conversion is effected, the patient should be placed on a maintenance dose of 0.2 gram of quinidine three to four times daily for a few days, during which time digitalis may be discontinued. Quinidine may then be gradually decreased to a maintenance dose sufficient to prevent recurrences, or it may be discontinued. Differences of opinion exist as regards the efficacy of maintenance quinidine in the prophylaxis of recurrent atrial fibrillation. My personal preference is to recommend maintenance therapy in persons whose attacks become more frequent and of longer duration or whose episodes are associated with symptoms ensuing from tachycardia.

SUMMARY

Sixteen young military men with transient atrial fibrillation were observed in whom no definite evidence of organic heart disease could be found. In military medicine when predominantly young men on active military duty are seen, atrial fibrillation may often be the idiopathic or benign variety. However, the most common causes of this arrhythmia, rheumatic and arteriosclerotic heart diseases, hyperthyroidism, hypertension, and coronary artery disease, must be ruled out.

In about 10 per cent of the patients with functional transient atrial fibrillation the episodes of arrhythmia may become progressive with eventual establishment of permanent fibrillation. The remainder either have recurrent attacks fairly regularly or the episodes may become less frequent, of shorter duration, or may cease entirely, either spontaneously or with drug therapy.

This arrhythmia in the absence of organic heart disease is benign and has an excellent prognosis. The ability of these patients to perform satisfactory military duty is not appreciably impaired.

The patient with infrequent fibrillation of short duration, and mild or no symptoms (one third of this series), requires no definitive therapy. A rapid ventricular rate, particularly if over 150 per minute, is the most positive indication for definitive therapy with digitalis and/or quinidine. All patients should be thoroughly instructed as to the benign nature of this disorder and urged to eliminate precipitating factors. Maintenance therapy with quinidine is recommended for patients whose attacks become progressively more frequent and of longer duration, and whose symptoms of an excessively rapid heart rate are pronounced.

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TRENDS IN THE MANAGEMENT OF PULMONARY TUBERCULOSIS

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TUBERCULOSIS is a serious problem in the United States just as it is in most nations of the world. Despite a dramatic decline in mortality of 70 per cent in the last 10 years to the current rate of about 10 per 100,000 population, the morbidity rate and cost of medical care is still high. This is evidenced by the fact that 1,200,000 persons have some form of tuberculosis; 250,000 are carried on the caseload of health agencies as active cases; 86,000 persons were added to the active caseload within the past year; an estimated 150,000 persons have undetected tuberculosis; and the annual expenditures for detection, prevention, and treatment are around six hundred million dollars.[1]

The availability of new effective antituberculous drugs and surgical procedures has increased the potential for the cure of tuberculous patients. Because of these advances the responsibility of the physician to utilize these new methods of treatment to the best advantage has greatly increased. For this reason it is important to review periodically trends in the management of this serious disease.

HOSPITALIZATION AND HOME-CARE PROGRAMS

It is generally recognized by tuberculosis specialists the world over that when hospital facilities are available, the patient with newly discovered active pulmonary tuberculosis should receive his initial treatment in the hospital rather than at home. In the ideal situation such treatment is best continued in a tuberculosis hospital until the disease becomes arrested or inactive, that is, no tuberculosis organisms are recovered from the sputum (conversion) and a noncavitary pulmonary lesion is stable for a period of from 3 to 6 months. Under less favorable circumstances it is helpful to at least hospitalize the new patient for several months to: (1) secure a proper diagnosis and evaluate the individual pa-

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tient, (2) educate the patient and his family as to the nature of the disease, (3) treat the patient with specific drugs until the therapeutic goal appears to be in sight, and (4) reduce the risk of contagion to members of his family and the community. Treatment in the home during the early contagious stage of the disease is difficult for the patient, hazardous for his associates, and unsatisfactory from the physician's standpoint in most cases. The modern tuberculosis hospital is a complex institution with complete clinical and laboratory facilities, an elaborate radiologic department, a professional staff of internists, surgeons and consultant specialists, research workers, social workers, and rehabilitation and educational experts—all of which are essential to the successful and enduring clinical results.

Except when hospital beds are unavailable or when persons refuse hospitalization, most of the home-care programs in the United States are concerned primarily with pre- and posthospital treatment rather than with a planned replacement of hospital care by outpatient care. Most authorities now agree that when hospital care is unavailable for any reason, active drug therapy should nevertheless be instituted promptly. The need for prolonged prehospital treatment is diminishing in most sections of the United States as the hospital waiting lists are rapidly disappearing.

In some countries the incidence of tuberculosis is so high that hospitalization for most patients is out of the question. Under such circumstances attention must be focused on the establishment of effective health centers to conduct extensive case-finding surveys and to operate outpatient services for patients undergoing treatment at home. If private physicians co-operate well with public health officials, it is possible to conduct such a program satisfactorily as long as an adequate number of public health nurses are available to visit the patient's home and to administer that phase of supervision which deals with proper isolation technics, the evaluating of contacts, and similar phases of tuberculosis control.

REST THERAPY AND REHABILITATION PROGRAMS

During the past few years there has been considerable disagreement regarding the time-honored measure of rest therapy, and gradual changes are being adopted. With the introduction of successful drug therapy reorientation was inevitable, but it will be some time before optimal standards can be determined. Possibly the modifications and shortening of rest treatment are proceeding too rapidly, but if so this is not yet reflected either in a slowing of the rapid rate of decline in mortality or in any definite increase in morbidity. On the contrary, the trends appear to be continuing favorably.

In July 1954 an investigation of in-hospital ambulation of patients with pulmonary tuberculosis was begun at this hospital.[2] It is a randomized study designed to compare the results of treatment as observed during the conventional rest program with patients undergoing the ambulatory treatment regimen. The latter group do not observe rest periods and are allowed to be up and around the hospital wards and grounds near the hospital building at will. Strict isolation care is adhered to. Thus far no appreciable difference has been noted in the response of the two groups as measured by sputum conversion and by roentgenographic evidence of clearing of the lung lesions. The morale of the ambulant group is much better than in those treated with strict bed rest. The educational and rehabilitation training can begin shortly after admission and can be utilized in a better manner in the ambulant group. Inasmuch as patients take care of many of their own needs, fewer nurses and ward attendants are required to supervise the ambulatory treatment regimen. Thus far this disregard for the traditional rest program apparently has not harmed the patient. It should be pointed out, however, that these studies have been made under the close supervision of the staff of a specialized treatment center where patients are treated with antituberculous drugs to the stage of arrested or inactive disease.

Ambulation of patients with pulmonary tuberculosis under protection of chemotherapy has been reported on favorably by Dressler and associates[3] and less favorably by Robins and associates.[4] In the study by Dressler and associates, conducted at the National Jewish Hospital, Denver, Colo., patients received their medical therapy in the hospital but were permitted to undergo outpatient treatment for active disease when their physical condition and home facilities permitted. Co-operation among the patients was good, and the results appeared to be impressive. No control studies were made in this group.

The chief criticism of the ambulatory treatment of patients at home under unfavorable conditions is that persons with contagious stages of the disease are at large in the community. Those who oppose this type of program, however, fail to appreciate that if it were not available, most of these patients would be receiving no treatment. Such compromise must be made if hospital beds are not available or if the state or federal laws do not permit enforced treatment of the recalcitrant or un-co-operative patient. The obvious answer to this difficult problem is an acceptable hospital and home-care treatment program and health laws to provide adequate isolation of the patient with contagious forms of this disease. For practical purposes the latter should include all tuberculous patients with positive sputum, any person with pulmonary cavitation, patients with recently discovered active pulmonary tuberculosis, and those with active disease not receiving drugs.

The rehabilitation program for tuberculous patients in hospital or at home must of necessity be planned to meet patient and community needs, and it is most difficult to formulate plans applicable for all conditions. Under most circumstances, however, it is desirable to standardize the rest and rehabilitation program. Unless this is done, personnel of tuberculosis hospitals, outpatient departments, and public health nurses will not always be acquainted with the stage of recovery of the individual patient and the treatment or training applicable for each. The physical and economic rehabilitation of the patient is receiving much attention these days because more patients are recovering than ever before and plans for their future employment are extremely important to the individual and the community. The rehabilitation program can best be administered by a classification of patients based on the activity of the lung disease and the patient's physical capacity to be restored to normal life activities and gainful employment. Such a plan has been used successfully for many years by the United States Army in the treatment program at this hospital[5] and can be modified for civilian patients.

The basic plan of management for the patient with a new minimal lesion (active disease, 1 month) responding ideally to treatment is illustrated in table 1. Such schedules are carefully planned for each individual patient on the basis of clinical findings, but the minimum time limits should seldom be reduced. Patients with more advanced forms of the disease are treated on the same principles but their exercise status is altered more slowly, and frequently with the addition of operative procedures. To classify the patient for rehabilitation purposes the diagnosis should indicate the duration of activity and inactivity of the disease and the exercise status.

The basic rules for the management of patients with pulmonary tuberculosis are:

1. *Bed rest and chemotherapy* are prescribed for all patients with active tuberculosis on definitive treatment and are maintained until the pulmonary lesion is found stable in serial roentgenograms for 3 months. Increased ambulation with pass privileges is then allowed.

2. *Ambulatory treatment* (exercise status III B) is permitted after the disease becomes inactive and the lesion is stable for 6 months. For most lesions it is desirable to use chemotherapy to this stage of disease or longer.

3. *Hospital care* is best used until the chest lesion is stable for from 3 to 6 months. It is desirable to defer discharge until the patient has been ambulatory for 3 months and the response (symptoms, sputum, and roentgenograms) to graduated exercise has been determined. When hospital beds are not available or not

TABLE 1. *Rehabilitation program for patients with new minimal lesions* and optimal response during therapy*

Lesion		Clinical findings			Basic rest and rehabilitation	
Activity	Duration (months)	Symptoms	Sputum	Roentgenogram	Status	Program
Active tuberculosis	1	Hemoptysis, fever, cough, abundant sputum	Positive	Unstable	I	Strict bed rest. Bedside nursing very important.
	2	Absent	Positive	Unstable	II	Modified bed rest with bathroom privileges and 4 hours out of bed daily as symptoms subside; care should be used in the presence of extensive disease and/or cavitation. Bedside nursing care not required.
	3	Absent	Negative	Unstable		
	4-6	Absent	Negative	Stable**		
	7-9	Absent	Negative for 3 months	Stable for 3 months	III A	Semiambulant care with 8 hours out of bed daily. Pass privileges. Home care when feasible at this stage.

TABLE 1. *Rehabilitation program for patients with new minimal lesions* and optimal response during therapy*—Continued

Lesion		Clinical findings			Basic rest and rehabilitation	
Activity	Duration (months)	Symptoms	Sputum	Roentgenogram	Status	Program
Inactive tuberculosis		Absent	Negative for 6 months	Stable for 6 months	III B	Ambulatory care with 12 hours out of bed daily. Discharge from treatment center to home at this time.
		Absent	Negative from 6 to 12 months	Stable from 6 to 12 months	IV	Normal life when disease is inactive 6 to 12 months; restricted duty or work at first, and full duty or work in 2 to 3 years as judged by the physical capacity of each patient. The extent of the original disease also will be a determining factor in the type of work permitted.

*Based on *Diagnostic Standards and Classification of Tuberculosis*, National Tuberculosis Association, 1955, which should be consulted in formulating such plans and for definition of terms used in the table.

**Stable: Noncavitary lesions by serial roentgenograms.

needed for definitive treatment (chronic, inoperable cases, et cetera), home care may prove satisfactory if the patient (a) does not require specialized hospital treatment, (b) has a suitable place for his care and isolation, (c) understands tuberculosis, and (d) will not be a community health problem.

4. The patient may live an essentially *normal life* (exercise status IV) after the disease has been inactive for from 6 to 12 months, except that exercise must be restricted. Physical activity is then gradually increased over a 2- to 5-year period, based on an evaluation of each individual patient's physical capacity (exercise or work tolerance).

5. The same principles apply to *surgical cases*. Patients having resections for pulmonary lesions often go home from 3 to 6 months after an operation. Six months in the hospital is desirable after resection or thoracoplasty for extensive disease.

CHEMOTHERAPY AND OPERATIVE PROCEDURES

A review of the trends in the use of antituberculous drugs and the surgical treatment of tuberculosis reveals that these measures must frequently be combined; for this reason, certain precautions must be observed. Furthermore, the responsibilities of the general practitioner, the internist, and the thoracic surgeon in the co-operative effort to cure the tuberculous patient may be better understood if these two types of therapy are discussed together.

Drug therapy of tuberculosis often produces dramatic results, but it must be remembered that frequently it is not curative and must be integrated with a good rehabilitation program (table 1) as well as with operative measures (table 2) as the individual case dictates.

Reversible lesions responding well to drug therapy may be treated by any effective, long-term drug regimen [streptomycin sulfate-para-aminosalicylic acid (SM-PAS), streptomycin sulfate-isoniazid (SM-INH), and isoniazid-para-aminosalicylic acid (INH-PAS)] without fear of future complications in the majority of the patients. However, when acute caseous pneumonic tuberculosis, chronic fibrocaseous, or fibrocavitary disease is present, one must be ever mindful that drugs may not prove definitive and that surgical resection or other operative procedures may be required for the serious residuals remaining after adequate chemotherapy. It should be borne in mind that the persistent cavity is the main problem in the management of tuberculosis today. In the patient capable of tolerating an operation these must be treated surgically. In addition to these, chronic caseonodose lesions not responding satisfactorily to medical management, large necrotic foci, especially the residuals of recent cavitation, symptomatic tuberculous bronchiectasis, and the destroyed lung, lobe, or segment constitute lesions ordinarily beyond the definitive use of drug therapy.

Pulmonary cavitation that does not respond to medical management in 6 or 8 months is not apt to do so, and the incidence of drug resistance mounts after this period of chemotherapy. It has been shown in a carefully controlled study at this hospital that after utilizing our best combined drug regimens, approximately three fourths of the cavities present before the initiation of drug therapy were still visualized in the ordinary roentgenogram of the chest at 4 months, 50 per cent at 6 months and 33 per cent at 8 months. With the protection of effective drug therapy, pulmonary resection was accomplished in most of the patients considered as favorable operative risks with a very low mortality and morbidity rate. Recent reports[6] show an over-all mortality of 14 per cent in pneumonectomies, 4 per cent in lobectomies, and 1.5 per cent in segmental and subsegmental resections. At this hospital, where the predominant type of operation in the past two years has been resection for localized lesions, the mortality rate was less than 1 per cent. The major complication of chest surgery is the development of bronchopleural fistula, but results are better under circumstances where drug protection is most effective. Complications are more of a problem in re-treatment cases where drug resistance has appeared. It is important, therefore, to establish a plan of management that integrates the need for surgery in the over-all medical program, particularly in relation to proper timing.

Combined drug regimens utilizing the three best chemotherapeutic agents in one combination or another (SM-INH, SM-PAS, INH-PAS, or SM-INH-PAS) have been superior to the administration of single antimicrobial agents, and their dosage and method of utilization has been well documented in the literature.[6-10] At least one of the most potent agents, streptomycin sulfate or isoniazid, should be reserved for use in the event that a resistant organism or reinfection develops. In general, patients undergoing home care are best treated with the INH-PAS regimen. Streptomycin sulfate is usually more conveniently employed for those patients who are undergoing hospital care. When prolonged treatment with SM is anticipated for patients having extensive disease in whom the outcome is very much in doubt (*e. g.*, bilateral cavitary disease), it is desirable to combine SM with PAS (to conserve INH) unless PAS intolerance makes its combination with INH necessary. The experienced chest physician will recognize pulmonary lesions which may be expected to respond favorably in from 1 to 2 years to a well-integrated therapeutic program, and it makes little difference what combination of drugs (SM, INH, and PAS) are utilized in such patients. These include, for example, patients with minimal pulmonary lesions, uncomplicated pleural effusion, recent noncavitary lesions of moderate extent which are presumed to be predominantly reversible by their diffuse or ill-defined characteristics in the chest roentgenograms,

TABLE 2. *Integrated drug and surgical treatment of pulmonary tuberculosis, based on an estimate of the lesion*

Classification of lesions	Medical treatment	Surgical treatment
	Specific drugs; temporary collapse	Specific drugs; pulmonary resection and/or thoracoplasty
Undetermined Unclassified lesions (new patients)	Start drug therapy and classify lesions on basis of response as reversible disease and irreversible fibrocaseous disease (caseonodose and fibrocavitary) as shown below. Use drugs to inactive stage for all lesions.	
Reversible Miliary tuberculosis Nonnecrotic lesions of diffuse exudative and disseminated nodular type	Reversible lesions are medical problems. Use continuous drug therapy until the inactive stage of disease. Operative procedures not required.	
Reversible and irreversible Acute caseous pneumonic tuberculosis Acute phase	Medical measures (drugs and possibly pneumoperitoneum) are required for early phase of treatment and may prove definitive.	
Chronic phase		After 6 to 12 months of drugs for acute phase consider surgical intervention for residual necrotic and cavitary lesions. (See surgical treatment of irreversible fibrocaseous component below.)

TABLE 2. *Integrated drug and surgical treatment of pulmonary tuberculosis, based on an estimate of the lesion*—Continued

Classification of lesions	Medical treatment	Surgical treatment
Reversible and irreversible —*Cont'd.* Chronic fibrocaseous tuberculosis (caseonodose and fibrocavitary lesions) Mixed lesions with a reversible exudative component Irreversible fibrocaseous component	Specific drugs; temporary collapse Reversible lesions and scattered noncavitary caseonodose residuals may respond to drug therapy. If not, consider surgery.	Specific drugs; pulmonary resection and/or thoracoplasty Surgical intervention often required for: open cavitary lesions; large necrotic foci, especially filled-in cavities; destroyed lung or lobe; chronic relapsing disease with positive sputum not responding to drug; tuberculous bronchiectasis with active symptoms.

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and finally the more serious necrotic lesions with or without cavitation, so well localized that definitive surgical treatment may be considered after 6 to 12 months of drug therapy. At the present time there appears to be no need to combine all three of our commonly used drugs (SM, INH, and PAS) in the routine treatment of pulmonary tuberculosis. Complications of miliary or meningeal disease or seriously ill patients with acute caseous pneumonic tuberculosis are exceptions to this generalization.

It has been fairly well established that prolonged, uninterrupted drug treatment produces the most lasting treatment results. Follow-up studies at this hospital have revealed a high relapse rate in patients treated in the prechemotherapy era. This was greatly reduced by the utilization of short drug regimens (from 2 to 6 months), but following the adoption of long-term chemotherapy in 1951, with treatment continued to the stage of inactive disease, less than 5 per cent of the patients have had relapses (table 3). From these studies it is reasonable to conclude that drug therapy should be used for patients undergoing definitive treatment until the lesion has been well stabilized for a prolonged period. The therapeutic target point of "inactive disease" as defined by the National Tuberculosis Association means that the patient has no symptoms due to tuberculosis, the sputum is negative, and the roentgenograms of the chest reveal a stable, noncavitary lesion for at least six months. If this stage of recovery is reached in less than 12 months, drug therapy should be continued for a minimum of one year. After surgical procedures, particularly resection for lesions revealing active disease in the resected lung specimens, drugs should be continued no less than from 6 to 12 months after the operation.

There have been no new developments in the field of operative procedures for pulmonary tuberculosis except for the virtual abandonment of pneumotherapy, decreased use of thoracoplasty, and the extended use of pulmonary resection. Of the temporary collapse procedures, so important a few years ago, only pneumoperitoneum has carried over into the current chemotherapy era. Its value is perhaps limited to the treatment of cavitary disease, used early in the course of treatment,[10] but the operation is used infrequently today. Primary thoracoplasty is seldom employed, but it may be useful for cavitary disease of the upper lobes when disease elsewhere is too extensive to consider resection. The removal of localized pulmonary lesions has been made possible by prolonged chemotherapy, and proportionately more wedge and segmental resections are now possible. These trends are well illustrated by the statistics of chest surgical procedures utilized at this hospital during 1947-1955 (table 4).

One new chemotherapeutic agent, cycloserine, has been introduced recently under the proprietary names Seromycin and Oxa-

TABLE 3. *Disposition of temporary retired cases reviewed at Fitzsimons Army Hospital to 1 January 1956*

Type of disease	Year retired	Total cases	Restored to duty	Temporary retirement continued	Permanent retirement*	Relapse**
Pulmonary Tuberculosis	1950	50	41	7	2	3
	1951	108	88	19	1	12
	1952	153	119	32	2	6
	1953	318	263	51	4	10
	1954	129	89	39	1	2
Total		758	600	148	10	33 (4.3%)
Pleurisy with effusion	1950	16	15		1	
	1951	45	44		1	1
	1952	56	52	2	2	
	1953	103	101	2		
	1954	61	54	7		
Total		281	266	11	4	1 (0.4%)
Other tuberculosis	1950	13	13			
	1951	13	10	3		2
	1952	8	8			
	1953	29	26	3		
	1954	15	11	4		
Total		78	68	10	0	2 (2.5%)
Grand total		1,117	934 (84%)	169 (15%)	14 (1%)	36 (3.2%)

*Permanently retired because of: Tuberculosis 3; Nontuberculous disease 11; 14

**Relapses are included in either the permanent retirements or the temporary retirement continued.

mycin.[6, 8–11] This antibiotic is undergoing clinical investigations at present and is not available for general use. Preliminary reports indicate that the drug alone is less effective than other combined regimens; however, in combination with INH it may prove effective. At dosages of 1 gram daily, or higher, convulsion will occur in about 5 per cent of patients. None have been reported with dosages of 0.5 gram daily. The role of Pyrazina-

mide (brand of pyrazinoicacid amide)[12-17] has not been clearly defined in spite of extensive study in the past few years. Its best application appears to be in combination with INH but its hepatotoxic effect limits its use and it has not been made generally available.[10, 12, 17]

TABLE 4. *Thoracic surgical procedures at Fitzsimons Army Hospital, 1947-1955*

Year	Thoracoplasty	Pulmonary resections	
		All types	Segmental and wedge
1947	90	13	6
1948	96	34	10
1949	28	65	9
1950	44	82	16
1951	32	121	39
1952	23	128	80
1953	21	208	128
1954	2	235	174
1955	2	123	84
Total	338	1,008*	546

*Lobectomy, 443; pneumonectomy, 29; segmental resection, 385; wedge resection, 161.

DISCUSSION

The improvements that have been made in the management of pulmonary tuberculosis in the past five years have greatly increased the patient's chances for recovery. Furthermore, statistical studies made on the health of patients who have recovered from this disease during the era of prolonged chemotherapy show that most patients treated to the stage of inactive disease remain well (table 3).

There are a considerable number of patients who cannot be treated successfully because of inoperable, active, far-advanced disease. There is presently no solution for these problems, and because of the factor of contagion, rehabilitation of the patient to a useful place in society becomes difficult even though his general health remains good. Hope for partial rehabilitation for this group of so-called "good chronics" lies in the possible total eradication of *Mycobacterium tuberculosis* from the body by some effective drug combination not yet discovered, thus removing the public health hazard. Conversion of the sputum to negative with the continuous use of agents now available is helpful in this

group of patients, but experience is lacking on how many years these drugs will keep the sputum negative.

Still another group of individuals who are greatly improved by chemotherapy do not fully recover because of persistent cavitary residuals and the unavailability of effective surgical treatment. This group offers a great challenge for the future. Since all operable patients with persistent cavitary tuberculosis require surgical treatment, the training of more thoracic surgeons is a matter of great urgency in most countries.

Pulmonary tuberculosis in patients who have received drug therapy has been a subject of much interest in recent years. In spite of intense investigation, one of the most controversial problems has been the method of choice of treating necrotic foci of varied size and extent which remain after prolonged courses of chemotherapy. Many of these patients without persistent cavitation recover and remain well, but the threat of relapse under physical stress and the prolonged physical restriction required to assure continued good health makes this problem of more than academic interest. It is known that present-day antimicrobial agents do not sterilize the necrotic lesion and *Myco. tuberculosis* persist in many of these areas. Furthermore, healing of the unsloughed necrotic focus is by the slow process of fibrous encapsulation and gradual drying out of the contents which may require many years.

The sloughing of the necrotic lesion results in cavitation which must terminate in one of the following ways: First of all, it may slough completely and close cleanly, leaving only a small scar of no clinical importance. The opening of the cavity may close and constitute the so-called blocked cavity or tuberculoma with its accumulated caseous and necrotic tissue. These lesions are potentially dangerous because it is unusual for them to absorb and difficult for them to organize or to slough completely so that viable *Myco. tuberculosis* can persist in them for long periods and eventually be disseminated. Mitchell has shown a 25 per cent clinical relapse in such cases prior to chemotherapy.[18] Studies at this hospital revealed from drug assays of resected tuberculomas that streptomycin sulfate does not penetrate the fibrous walls and viable bacilli are frequently present.[19] Another result that follows sloughing of necrotic lesions may be the manifestation of so-called open cavity healing in which epithelization of the bronchocavitary junction prevents complete closure by interfering with the approximation of the opposing granulation tissue surfaces. It is rare that such a lesion exists as an innocuous focus. More often than not, caseous areas remain in or near the cyst-like cavity wall and hence such lesions must always be presumed dangerous. Finally, the sloughing of the caseous lesion may result in an open cavity with necrotic walls containing

numerous viable *Myco. tuberculosis*—the most dangerous of all lesions as far as contagion and spread of infection is concerned.

The question of how to treat the patient with negative sputum and who has small, residual, noncavitary, necrotic foci has not been completely answered, but the trend is toward conservative treatment. The solution to this problem is a difficult one, because diagnostic methods are not exacting enough to differentiate these lesions which are well encapsulated and stable from those which have great potential for breakdown because of their bronchial communications and lack of fibrous encapsulation. It is known that cavities and foci of active disease that were unsuspected by roentgenographic examination are sometimes found by the surgeon at the operating table. Furthermore, one cannot determine preoperatively the bacterial flora of the necrotic focus, whether the organisms will be abundant, or whether it will be difficult to culture them due to the bacteriostatic effect of the low oxygen tension and presence of organic acids. The real significance of the few organisms that survive in a dormant state has not been determined, but it must be presumed that they carry danger of relapse for many years. Studies have been proposed to solve the problem of therapy for these patients by analyzing the results after treating some with resection of the lesion and treating others by prolonged drug therapy. This, of course, will be limited largely to research centers and until a solution is forthcoming through long-term follow-up studies, one must arbitrarily decide from the present available facts the treatment of choice. Unless there is evidence that the disease is not controlled well by chemotherapy, as evidenced by clinical roentgenographic or bacteriologic findings, patients with small caseous foci should have drug therapy at the present. The gratifying results from antimicrobial therapy alone, and the unavailability of thoracic surgeons to operate on the known cavitary lesions in patients urgently in need of surgery, fully justifies this approach at present.

It is recognized that drug therapy and operative procedures are very important in the treatment of the tuberculous patient, but it should be remembered that the total rehabilitation of the individual to his rightful place in society requires much more. We are treating an individual and not just a pulmonary lesion. Patients must be carefully supervised until they recover from their disease and then be placed in positions of employment that will give them a reasonable chance of remaining well. The importance of this phase of management is well illustrated by the experiences at this hospital (table 3). Eighty-four per cent of 1,117 tuberculous patients among military personnel treated in the hospital to the inactive stage of the disease were rehabilitated and declared fit for restoration to duty in the period 1949 to 1956. The relapse rate in this series was only 3.2 per cent, and there were no deaths

due to tuberculosis. This is good statistical evidence that a carefully controlled rehabilitation program is quite worthwhile.

CONCLUSIONS

The present-day treatment of pulmonary tuberculosis permits a very optimistic viewpoint for patients presently undergoing treatment and for continued success in the future. Inasmuch as all studies confirm the fact that those persons found in the initial stages of the disease can almost be assured of recovery and future good health if they co-operate with their physician, the responsibility to discover and treat these patients early is one of our most urgent problems. The success in treatment depends almost entirely on the extent of the chronic, necrotic, and cavitary residuals remaining after 6 to 12 months of specific drug therapy. If these residuals are very extensive, the opportunities for utilizing modern methods of therapy in a definitive manner may be lost.

In the final analysis, each patient with pulmonary tuberculosis must be judged individually, and the choice of his treatment made in relation to the character of the disease, the behavior of host resistance, the character of the chronic residual, and the degree of stress expected in the individual.

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A CONCEPT OF DIABETES

"We do not know the cause of diabetes, nor do we understand its very real relation to growth and size; but apparently diabetes in the latent form ("pre-diabetes") remains with the victim years or decades before he or she becomes overtly diabetic. During this time pregnancy, corticotrophin therapy, acquisition of Cushing's syndrome or of acromegaly, a staphylococcal infection, or overeating may uncover the individual already predisposed to diabetes. The previously adequately compensating pancreas cannot stand the additional stress completely, and evidence of the latent diabetic state is brought to the surface, divulging its menacing presence by embryopathies or changes in carbohydrate tolerance. Hence it is wrong to talk of diabetes only when glycosuria and hypercalcaemia are present. It is a disorder which goes back much further than that—even into the womb."

—W. P. U. JACKSON, M. D.
in *Lancet,* p. 631, Sept. 24, 1955

PLEURISY WITH EFFUSION DUE TO REMOTE TRAUMA

A Differential Diagnosis for Acute Idiopathic Pleural Effusion

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PLEURISY with effusion, especially when discovered in young people, has long been a difficult and vexing problem to the clinician. In many cases a definitive diagnosis may be made with the roentgenographic and laboratory methods ordinarily available; in a considerable number, however, the disease remains "idiopathic" despite careful and complete evaluation.

When patients with the "idiopathic" type have been observed for prolonged periods, it has been established that an appreciable majority eventually develop some signs indicative of tuberculosis.[1-3] In published series, the highest figure for the majority has been placed at 66 per cent;[1] it has been estimated, however, that tuberculosis is the cause of as high as 90 per cent of cases of pleurisy with effusion without demonstrable cause.[4] Pathologic studies of pleural adhesions have reinforced this close relationship to the incidence of tuberculosis.[5] From these sources has evolved the clinical dictum that an idiopathic pleural effusion in a young person is tuberculosis unless proved otherwise.[6]

When doubt exists as to the cause of a pleural effusion, accurate diagnosis of the cause by biopsy with a Vim-Silverman needle[7] or through direct incision[8,9] has been advocated as a diagnostic procedure. The two series in which pleural biopsy was done were composed of 45 patients and included a description of a method of pleural biopsy[9] and considerable information as to the pathology of pleurisy with effusion.[8] Both series stressed that only atypical cases warrant this procedure; more conservative diagnostic methods usually suffice. The proportion of nontuberculous to tuberculous pleurisy varied from 4:21 in one series to 9:24 in the other, all in the latter series initially being considered

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as probably tuberculous. The method of selection probably accounted for the difference in the above figures. Parenthetically, in the second series, three cases were considered as due to tuberculosis because of the finding of acid-fast bacilli in sputum or chest fluid, but at surgery no sign of specific infection could be found. In both reports the authors concluded that, in cases where the diagnosis is in doubt, pleural biopsy is a safe and effective tool.

Trauma, long known to be a cause of pleural reaction and effusion, is considered to exert its effect at the time of the traumatic event. Persistent pleural abnormality is considered a result of unresolved hemothorax. No mention can be found in the medical literature of chest wall injury giving rise to pleural reaction with effusion sometime after the traumatic event, though several mechanisms exist that may give rise to this sequence of events.

This report deals with two instances of pleural fibrosis with effusion ascribed to trauma that occurred six months and two years prior to the discovery of the pleural disease. Both were men in their thirties, both were treated in a hospital at the time of the trauma, and both sustained rib fractures. One failed to demonstrate initially any signs, clinically or radiologically, of pleural reaction to the trauma; in the other patient a small amount of pleural fluid, thought to be hemothorax, had been completely absorbed by the time he was discharged at the end of the initial hospitalization. Several interval roentgenograms confirmed the absence of pleural reaction until the effusion appeared. Effusions in both patients developed in the area of maximum injury. Both were considered tuberculous, partially due to the report of acid-fast bacilli in the sputum or gastric contents on single specimens. Finally, because of inconsistencies in the clinical pictures of both cases, thoracotomy was performed to resolve the diagnosis and coincidentally serve as a therapeutic maneuver.

CASE REPORTS

Case 1. A 33-year-old man was admitted to this hospital on 8 April 1955 for evaluation of a pleural effusion.

The patient had been perfectly well prior to 19 March 1952 (several routine roentgenograms being reported as negative) when he was severely injured in an automobile accident. His injuries included multiple fractures of the first five anterior ribs on the right as well as the sternum. A roentgenogram on the day of injury revealed only the rib fractures, but subsequently a pleural reaction was noted on the right as well as an atelectatic area in the right upper mid-lung field. A roentgenogram 19 days later was similar, but by 2 June the reaction was much smaller. Films taken in September 1952 showed complete disappearance of these findings (fig. 1).

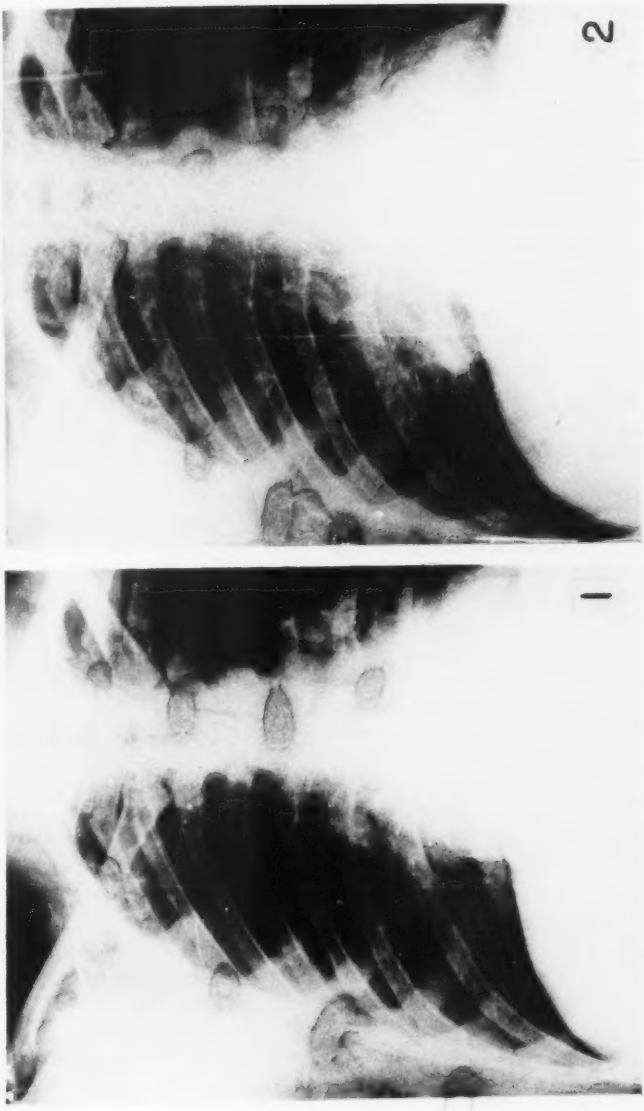


Figure 1 (case 1). Roentgenogram of the right side of the chest taken in September 1952. The healed fractures of the anterior portions of the right ribs may be seen. No pleural reaction is present. Figure 2 (case 1). Roentgenogram taken in October 1953. The patient complained of a cough. The density seen at the cardiophrenic angle was considered to be a patch of pneumonitis.

In October 1953, he complained of a chronic cough, and a roentgenogram taken at that time revealed an infiltrate along the right cardiac border (fig. 2). He was treated with chlortetracycline hydrochloride (aureomycin) and the area was clear on subsequent films (fig. 3).

In January 1955, he complained of wheezing. Roentgenographic findings at this time were normal except for the healed rib fractures (fig. 4). In February, pain of a pleuritic type appeared in the right side of the chest. A roentgenogram at this time showed reappearance of the paracardiac density on the right side and slight clouding of the costophrenic sulcus (fig. 5). He was thought to have pneumonia but in April 1955 roentgenograms revealed blunting of the costophrenic angle (not seen in the previous film) and an area of discoid atelectasis in the right lower lobe (fig. 6). At this time he was admitted to this hospital.

Physical examination revealed only dullness to percussion and a few scattered crepitant rales over the lower right side of the chest posteriorly. The temperature never exceeded 99.4°F, and usually was normal.

Complete blood cell counts were within normal limits. The corrected sedimentation rate ranged from 25 to 32 mm/hr. Cold agglutinin titers on at least six occasions were normal.

Bronchoscopy revealed inflammation of both middle and lower lobe bronchi. A biopsy of this area revealed only chronic inflammation. A tuberculin skin test using first strength PPD was read as questionable and one using second strength PPD was strongly positive. A thoracentesis yielded 65 ml of blood-tinged fluid. A smear of this fluid was negative for tumor cells and acid-fast bacteria; the fluid was sterile for acid-fast and pyogenic bacteria on culture. Several sputum, blood, and urine cultures were negative for pathogens; cultures of sputum for fungi were negative. Eight sputum smears and cultures were obtained and were negative for acid-fast bacteria; however on 26 April, acid-fast bacteria were identified in a sputum smear; and, after seven days' culture on blood media, acid-fast bacilli were noted. This culture eventually proved to be a chromogenic organism, nonpathogenic for the guinea pig. On 27 April, a gastric smear revealed acid-fast bacilli. These did not grow on culture media; other gastric smears and cultures were negative.

Serial roentgenograms revealed only minor changes in fluid level and a small pneumothorax after thoracentesis (fig. 7). Clouding of the costophrenic sulcus on the right side was seen inconstantly on several films. Fluoroscopy revealed pulsation in that area, as well as restriction of the diaphragmatic excursion on the right. A course of antibiotics failed to alter the roentgenographic picture; because of the possibility of neoplasia he was referred to Fitzsimons Army Hospital for further study.

Additional preoperative studies there revealed a vital capacity of 3.4 liters (78 per cent of the predicted value). Sedimentation rate was

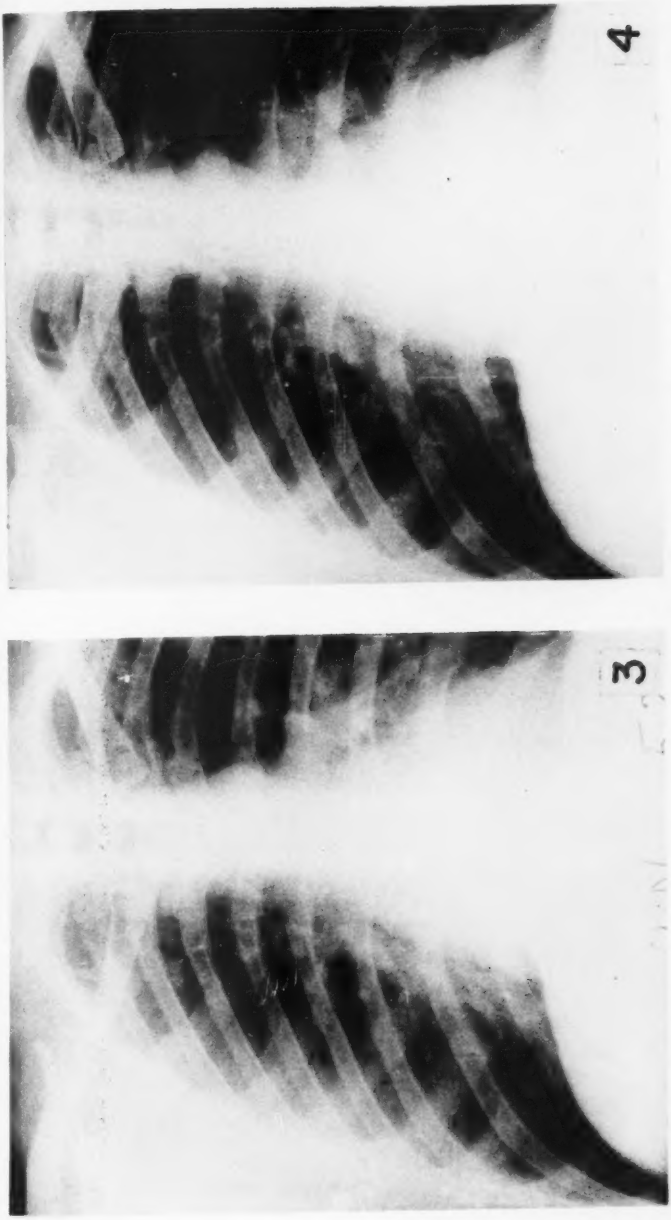
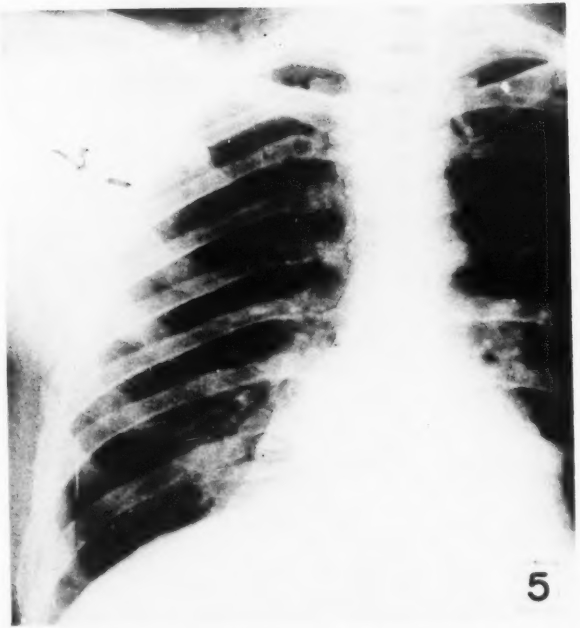


Figure 3 (case 1). Roentgenogram taken one month after figure 2. The density previously noted in the cardiophrenic sulcus is no longer visible. Figure 4 (case 1). Roentgenogram taken in January 1955. At this time the patient complained of some wheezing. Both costophrenic and cardiophrenic angles are normal.



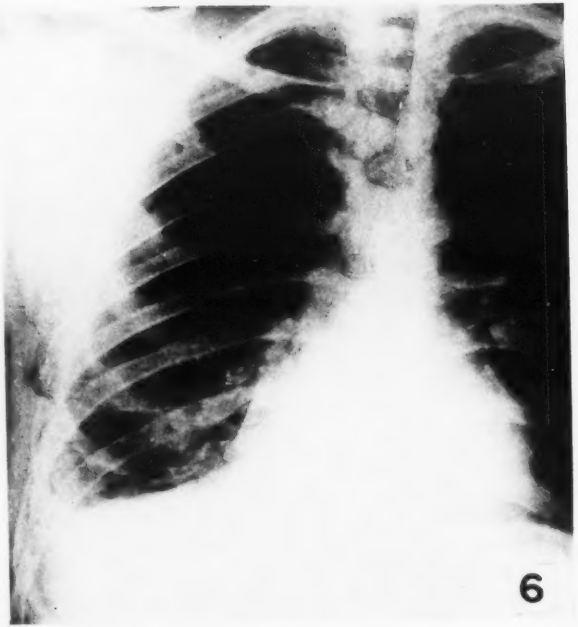


Figure 5 (Case 1). Roentgenogram taken seven weeks after figure 4. The patient complained of pleuritic pain in the right side of the chest. There is some clouding of the costophrenic sulcus and a more definite cloudiness in the cardiophrenic angle. Figure 6 (case 1). The roentgenogram, taken one month later than figure 5, shows considerable fluid in the costophrenic angle and an increase in the paracardiac density. The linear density just above the fluid level was interpreted as an area of discoid atelectasis.

6 (case 1). The roentgenogram, taken one month later than figure 5, shows considerable fluid in the costophrenic angle and an increase in the paracardiac density. The linear density just above the fluid level was interpreted as an area of discoid atelectasis.

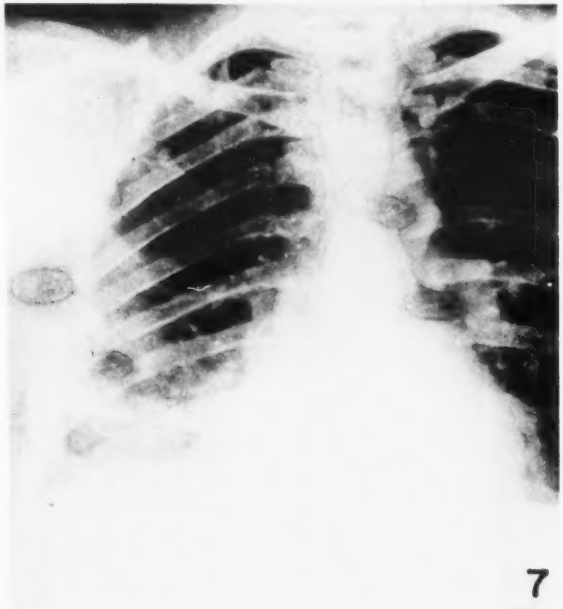


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Figure 7 (case 1). Appearance of the right side of the chest in July 1955, approximately two weeks prior to thoracotomy. The pleural fluid in the costophrenic sulcus has resorbed although the paracardiac density persists. The area previously considered atelectatic has increased somewhat; at exploration it proved to be pleural thickening. Figure 8 (case 1). Bronchogram, taken in the left oblique projection, showing filling of the right middle lobe and illustrating the well-filled but compressed bronchi that led to a preoperative diagnosis of "capture" of the right middle and lower lobes by pleural thickening.

11 mm/hr. Three gastric aspirations were negative for acid-fast bacilli on smear and culture. Reaction to a tuberculin skin test using first strength PPD was positive. Skin tests for coccidioidomycosis and histoplasmosis were negative. Bronchoscopic examination revealed a small, mucosal-covered, 0.5-cm lesion in the region of the lateral wall of the right middle lobe bronchus, obstructing about 10 to 15 per cent of the bronchial lumen. Biopsy of this area revealed only chronically inflamed bronchial tissue. Bronchial washings were negative on culture for acid-fast bacilli.

Laminagrams confirmed the thickening of the pleura over the right middle and lower lobes. The right middle lobe was partially atelectatic as was the anterior basilar segment of the right lower lobe. A bronchogram revealed the right middle lobe bronchi to be closer together than normal, but well filled. The basilar segments of the right lower lobe bronchus were only partially filled and some irregularity of the bronchial walls was noted (fig. 8). These results indicated that there was "capture" of the lower and middle lobe by thickened pleura. Treatment with penicillin and streptomycin sulfate was begun and a thoracotomy was performed.

The visceral and parietal pleura were adherent over the diaphragm, mediastinum, and pericardium. The thickest part, in the vicinity of the major fissure posteriorly and laterally, was 1 to 2 mm thick, firm and fibrous, and was entrapping the middle and lower lobes. Over the pericardium a mass of fat was encountered adherent to the pericardium and diaphragm by thin fibrous adhesions. This was identified as omentum and was completely separated. Palpation in the vicinity of the foramen of Morgagni revealed a firm fibrous plug of omentum but no real defect in the diaphragm. About 95 mg of pleural peel was removed.

On microscopic examination it was noted that sections of the pleural peel contained fibrous connective tissue and a prominent chronic inflammatory reaction consisting of lymphocytes and plasma cells. Several scattered granulomatous lesions containing multinucleated giant cells were seen. Neither caseation nor acid-fast bacilli were found in any portion of the specimens. The final pathologic diagnosis was nonspecific pleuritis.

The postoperative course was uneventful. A postoperative roentgenogram revealed some fluid at the right base which was gradually absorbed. The right costophrenic angle remained obliterated. The patient was discharged without further therapy to full duty. Six months later he was still active and completely asymptomatic.

Case 2. A 35-year-old man was admitted to this hospital for the second time on 3 September 1955 for evaluation of a pleural effusion.

In December 1954, the patient fell from a considerable height, fracturing several left posterior ribs. He was admitted to the hospital complaining of severe pleuritic pain in the left side of his chest and fever.

Roentgenograms, however, revealed no pleural or pulmonary lesions and he was discharged asymptomatic after nine days of rest and antibiotic therapy (fig. 9). He was completely asymptomatic thereafter. In July, he reported for an annual physical examination. Both physical and radiologic evidence of left pleural fibrosis and effusion were noted (fig. 10), and after preliminary outpatient study he was admitted to the hospital. The blood cell count was within normal limits and a urinalysis, serologic test for syphilis, and skin tests for tuberculosis, coccidioidomycosis, and histoplasmosis were negative. Thoracentesis on the fourth hospital day produced only 40 ml of clear, yellow fluid containing 1,100 lymphocytes per μl and 3.98 grams of protein per 100 ml. The fluid was sterile. A second thoracentesis 12 days later produced 100 ml of a similar fluid. In both cases, loculation of the fluid was believed to be present. The sedimentation rate varied from 17 to 33 mm per hr. Several sputa and gastric analyses were negative for acid-fast bacteria by smear and culture. However, one sputum specimen, obtained six days before operation, contained acid-fast bacteria on smear and culture. A guinea pig inoculated from this sputum survived. Autopsy failed to reveal evidence of tuberculosis.

Roentgenograms revealed minor variations in the extent of the effusion (fig. 11). At no time was a parenchymal lesion seen. Films made with the patient in decubitus and upright positions were almost identical, suggesting that most of the density represented pleural fibrosis rather than effusion. At fluoroscopy, the left diaphragm was somewhat limited in excursion. Roentgenograms of the gastro-intestinal tract, skeleton, and kidneys were normal.

The patient was completely asymptomatic and afebrile all through the period of investigation, during part of which he was returned to limited duty. A total of seven skin tests for tuberculosis utilizing second strength PPD were performed; all were negative. He gained approximately 12 pounds while in the hospital. Biopsy of the pleura with a Vim-Silverman needle was attempted; the specimen contained only skeletal muscle and fibrous tissue. The fibrous tissue was infiltrated with lymphocytes arranged perivascularly but was not identifiable as pleura.

Thoracotomy revealed a thickened pleura over the left lower lobe without obliteration of the pleural space. The lung was normal to palpation. Approximately 60 ml of thin, clear fluid was present. Surgical decortication was performed. Microscopic examination of the peel revealed only fibrous tissue with some minor inflammatory reaction (fig. 12). The pleural fluid was sterile on culture for acid-fast bacilli. The postoperative course was uneventful, the patient returned to full duty within 45 days, and was completely well 1 year later. He engages in relatively strenuous physical labor.

COMMENTS

It is not suggested that this report in any way controverts the current concept that tuberculosis is the cause in almost all

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Figure 9 (case 2). Roentgenogram of the chest taken immediately after the patient had fallen and fractured the left ninth and tenth ribs posteriorly (hidden by the diaphragmatic shadow). The costophrenic angle was normal. Figure 10 (case 2). Roentgenogram taken approximately six months after figure 9. There is now a left pleural effusion with pleural thickening.

idiopathic pleural effusions. However, pleural effusions complicate many diseases.[3,10,11] Occasional cases of pleurisy with effusion are seen, due to various causes, which either cannot be diagnosed by the usual means or are confused by false positive bacteriologic information. In the series of Stead, Eichenholz, and Stauss,[8] chronically active organizing pneumonia, prior spontaneous pneumothorax or hemopneumothorax, and histoplasmosis were the basis of effusions. Their experience with false positive bacteriologic tests for acid-fast bacilli has previously been mentioned.

Figure 11 (case 2). Roentgenogram taken a few weeks before operation. The pleural effusion has decreased slightly. No parenchymal lesion is seen.

We believe that prior trauma to the chest wall should be added to the list of causes of pleurisy with effusion. Neither remoteness of the trauma in terms of months to a few years, nor absence of pleural reaction at the time of injury eliminate trauma as a cause of the lesion. While it is difficult to draw conclusions from only two cases, some clinical support may be obtained for the diagnosis when a history of trauma is obtained. Our experience reemphasizes the value of the tuberculin skin test.[3] Tuberculous pleurisy with effusion is thought to be a consequence of either

rupture into the pleural cavity or contiguous inflammation. In the tuberculin-sensitive person the pleural reaction leads to a considerable exudation of fluid and dilution of organisms to a point where smears and cultures will appear sterile. Absence of tuberculous sensitivity, evidenced by negative skin reactions, would make this sequence unlikely. Where the problem has been investigated, conversion of the skin reaction from negative to positive has preceded the appearance of pleural effusion by six months.[12, 13]

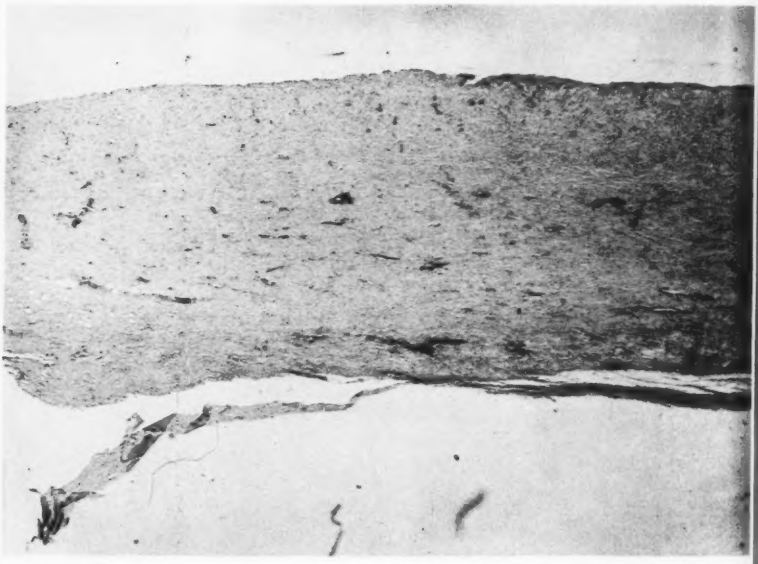

Figure 12. Section of pleural peel removed at thoracotomy. It consists almost entirely of fibrous tissue with but a minor inflammatory component. (× 130)

The presence of a relatively small effusion and a considerable degree of fibrosis, especially early in the course of the disease, demonstrated clinically by only small amounts of fluid available at thoracentesis and only minor changes in configuration in roentgenograms made with the patient in decubitus position, also suggests a nontuberculous cause. Stead, Eichenholz, and Stauss suggested laminagraphy as a means of demonstrating subpleural nodules; the absence of these may be added to other evidence in making a clinical diagnosis. Study of the pleural fluid sugar or beta-glucuronidase levels have also been mentioned as of diagnostic value.[14, 15] Finally, where doubt exists, the pleural biopsy would seem preferable to empirically treating the patient for tuberculosis. This procedure can be performed through a small incision, without most of the sequelae of major chest surgery.[9] Pleural

biopsy with a Vim-Silverman needle,[7] attempted in case 2, did not result in adequate tissue for a diagnosis.

The mechanism of the late development of pleural fibrosis and effusion after trauma is speculative, but some comments can be made. In case 1, the presence of herniated omentum probably acted as a stimulus for continued pleural reaction. In addition, pleural fluid had been present in this area shortly after the initial trauma but was completely absorbed during convalescence. The pleural peel was thickest over the major fissure, posteriorly and laterally, and presented the histological picture of a foreign body reaction. In case 2, no herniation was present; pleural laceration or hemopneumothorax may have appeared following discharge from the hospital. The complete absence of any symptoms during this period makes this unlikely however; it is more likely in both cases that radiologically invisible pleural inflammation remained after the acute traumatic phase apparently subsided. This inflammation may have excited further fibrosis. Continued fibrosis after inflammation analogous to keloid formation has been postulated as being the cause of masses of fibrous tissue in the pleura that have been labeled "pseudotumors."[16] Although this sequence usually follows an infectious disease, a similar pattern may occur with trauma and rib-pleural injury.

Once a considerable degree of fibrosis is present, fluid formation is explicable. Stead and his group encountered seven instances of what they referred to as "trapped lung" in a group of nine patients with nontuberculous pleurisy with effusion who were subjected to thoracotomy. They found that the lower portion of the lung was encased and compressed by a thin, tough fibrous peel. There was no pleural symphysis. The upper lobe, also covered by thickened pleura, could not fill the space left by the compressed lower lobe. As a consequence, fluid was drawn into the pleural space to restore normal pressure relationships. In case 2, a mechanism similar to this certainly existed. Both pleurae were thickened although there was no obliteration of the pleural space. In case 1 lung trapping was suggested preoperatively by the compression of the bronchi as seen on bronchogram. Further, at exploration the surgeon noted that the fibrous peel entrapped the middle and lower lobes to a significant degree. Despite removal of 65 ml of fluid by thoracentesis four months before, the pleurae were adherent, and no fluid was reported at operation. Apparently, continuation of the fibrosing process obliterated the necessary space.

Finally, it is interesting to mention briefly our experience with the reports of positive smears and cultures for acid-fast bacilli. In one case a simple chromogenic organism was involved. Case 2 is much more complex. Here a single smear and culture were positive. Although a guinea pig inoculated with a concentrate of the

material survived without change in reaction to the skin test, another animal, inoculated with the organism obtained from the culture, died, and autopsy revealed typical tuberculous lesions. Further study, however, revealed that the organism was resistant to streptomycin sulfate, para-aminosalicylic acid, and isoniazid, although the patient in question had received no therapy at that time. At the same time, the laboratory was processing a culture slant obtained from another patient previously treated and containing an organism with identical cultural reactions and sensitivities. In view of the persistently negative tuberculin test, the absence of parenchymal disease to palpation, and inspection at thoracotomy, and the nonspecific histological picture of the pleura, cross contamination in the laboratory seems likely. The experience of others with reports of acid-fast bacilli in body fluids later contradicted by the operative findings, has been alluded to previously. The opportunity for error is present in a situation like that of most small military hospitals where relatively untrained personnel collect and label specimens, and where such specimens must be shipped to a laboratory receiving and processing collections from many different areas. In addition, cross contamination is a possibility in the laboratory itself. The bacteriologic finding, then, must be carefully evaluated in the light of the clinical picture and associated tests. Where these are contradictory, the possibility of incorrect bacteriologic information must be considered.

SUMMARY

Tuberculosis is undoubtedly the cause of the vast majority of "idiopathic" pleural effusions. However, severe chest wall trauma may be a cause of some of the remainder. When a history of such an injury is obtained, the clinical and laboratory data must be especially carefully scrutinized for evidence of nontuberculous cause of the effusion. Where doubt exists, resolution of the dilemma by pleural biopsy would appear to be preferred to an empirical therapeutic regimen for tuberculosis.

In two patients with pleural effusion following trauma by months to years, partially because of false positive bacteriologic reports, and in part because of normal interval roentgenograms, tuberculosis was considered the diagnosis of choice. Contradictory findings led to exploration of the chest with examination of the lung, pleural biopsy, and finally decortication. In both, no evidence of tuberculosis was found, and the fibrosis and effusions were ascribed to the trauma. The mechanism of delayed post-traumatic pleural effusion is unknown but it is likely that radiologically invisible pleural inflammation remains after the acute traumatic phase subsides. This inflammation may produce increasing pleural fibrosis which compresses, encases, and traps the lung. As a consequence, fluid is drawn into the pleural space to restore normal pressure relationships.

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A PANORAMIC X-RAY DENTAL MACHINE

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JOHN W. KUMPULA
GEORGE DICKSON, *M. A.*

THE NEED for a simple and rapid method of recording dental conditions of large numbers of people has existed in the armed services for some time. Such records are particularly desired on persons entering the services to provide evidence of the general dental health level of the subject and information on dental treatment requirements during the service life of the individual and to aid in establishing identification records.

Present methods, in which intraoral films are used, require the placement and exposure of 14 or more films. This creates a time-consuming problem in processing and handling and fails to show pathologic conditions lying outside the field covered by the small films.

Several methods for producing full-mouth dental x-rays on a single film, both intraorally and extraorally, have been explored. Smathers,[1] Nelsen and Kumpula,[2] Zulauf,[3] Paatero,[4–6] and Blackman[7] have produced such radiograms using machines of various designs.

Development of a dental x-ray machine designed to produce full-mouth radiograms on single 5- by 10-inch films was undertaken at the National Bureau of Standards Dental Research Laboratory. The program has been carried on in co-operation with the U. S. Air Force Dental Service and the U. S. Air Force School of Aviation Medicine.

An extraoral method, termed curved-surface laminagraphy, was selected for the present development because of the simplicity of the technic and the fact that fitting and placement of a bulky lead-backed film in the patient's mouth would not be required. It was also decided that rotation of the x-ray source and film holder would be employed rather than rotation of the patient and chair as described by Paatero,[6] thus further simplifying the apparatus.

From Dental Research Section, National Bureau of Standards, Washington, D. C., where Colonel Hudson was Guest Worker, Mr. Kumpula is Laboratory Mechanic, and Mr. Dickson is Physicist.

Colonel Hudson is now assigned to School of Aviation Medicine, Randolph Air Force Base, Tex.

METHOD

The principles of curved-surface laminagraphy have been discussed by Paatero[4,5] and by Duhamel.[6,7] The essential condition for this type of radiography is that the shadow or image of the object that passes through a beam of x-rays must fall on a film that is moving at the same velocity as is the image. Paatero has shown that the synchronization of image and film in dental radiography can be obtained by rotating in opposite directions the subject and a film curved to the shape of the dental arch. In the panoramic machine described in this report, synchronization of image and film is obtained by moving a flat film by means of a cable passing around a cam shaped to simulate the curve of the dental arch.

The present form of the panoramic machine was adopted after preliminary studies were made to determine geometric relationships and factors influencing projection of images of the desired mouth structures. In one device, a light beam was employed rather than x-rays, and transparent plastic models of the dental arches containing opaquely outlined tooth silhouettes were used. Photographic printing paper was substituted for film. Information gained in the above experiment was applied to the design of another panoramic device using an x-ray source and a human skull. This model did not provide for movement of the x-ray source due to the bulk and weight of the x-ray tube head. The subject (skull) was rotated and the film-holding device rotated to achieve the same geometric pattern as had been obtained in the light beam model. Many radiograms were made with this device, using different x-ray exposures, different rates of motion, different positions of subject, film, and x-ray source, and various widths of x-ray beam. Information gained was used in the design of the machine that represents the final development achieved in this project to date.

In the final form of the machine, shown schematically in figure 1 and photographically in figure 2, the x-ray source and film holder are rotated around the subject so that the axis of rotation, R, is just medial to the angle of the mandible on the side opposite to that to be radiographed. The rate of linear motion of the x-ray beam as it sweeps the dental arch varies with the changes in curvature of this arch. Molar and bicuspid teeth, for example, lie on the circumference of a circle whose radius, r_T, is slightly shorter than that of a circle whose circumference passes through the incisor and cuspid teeth, the center of both circles being located at the center of rotation previously described. Therefore, the linear rate of motion of the film past the vertical slit, D E, in the face of the film holder must be slightly increased when projecting the anterior teeth as compared to the linear rate when projecting the posterior teeth. This variable rate is provided by the cam of the film-drive mechanism.

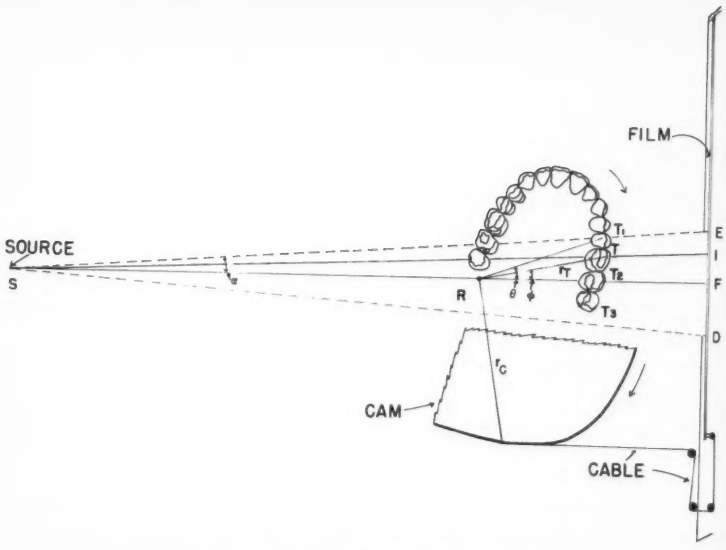

Figure 1. Schematic diagram of panoramic x-ray machine.

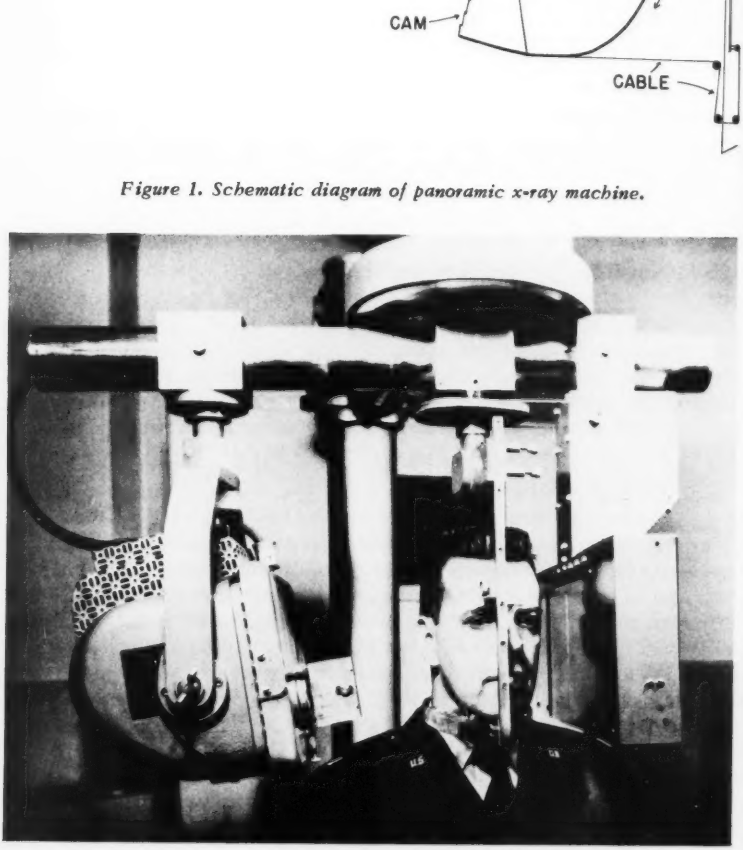

Figure 2. Panoramic x-ray machine.

Curvature of an average dental arch is simulated in each of the four lobes of the cam, and its contour is proportioned so that the proper rate of movement of the film past the film-housing vertical slit is maintained by the endless cable which passes around the cam and is attached to the film cassette. The result is a projection of those dental structures lying on the curved surface described by the dental arch, while structures lying outside or inside this surface are projected in such distorted and diffuse shadows that they do not interfere with the visualization of the structures to be radiographed. Since the divergence of the x-ray beam produces a slight magnification in the image, the over-all rate of the film movement dictated by the size of the cam must be slightly greater than the rate of linear motion of the x-ray beam along the line of the dental arch.

The method by which the panoramic image is obtained is shown schematically in figure 1. The diagram shows the arrangement for exposing one half of the arch. After this half is exposed, the subject is moved laterally so that the axis of rotation is back of the molars on the opposite side of the arch, the source and film holder are repositioned, and the second half of the arch is then exposed. In practice the subject and cam remain in a fixed position during the exposure while the source and film holder are rotated around them. In principle this is identical to holding the source and film holder fixed and rotating the subject as shown in figure 1. From this figure it can be seen that a clear image of T can be obtained only if the film moves so that at all times point I is on the extension of a straight line from the source S through T as T moves through the x-ray beam (from T_1 to T_2 to T_3). This condition will be met if

$$\frac{FI}{SF} = \frac{r_T \sin \phi}{SR + r_T \cos \phi} \qquad 1$$

where ϕ is equal to or less than θ. Since ϕ is small it can be assumed that $\cos \phi = 1$ and $\sin \phi = \phi$. Equation *1* therefore can be written

$$\frac{FI}{SF} = \frac{r_T \phi}{SR + r_T} \qquad 2$$

Using this relation, the dimensions of the cam required to control the movement of the film can be determined. The angular velocity ω of a point T moving through the x-ray beam from T to T_2 in time t is $\omega = \frac{\phi}{t}$ 3

and the linear velocity is

$$\omega r_T = \frac{r_T \phi}{t} \qquad 4$$

Assuming that the linear velocity V_I of the image across the slit is constant, from equation *2*:

$$V_I = \frac{FI}{t} = \frac{SF\ r_T\ \phi}{(SR + r_T)t} \qquad 5$$

Substituting from equation *3*:

$$V_I = \frac{SF\ \omega\ r_T}{SR + r_T} \qquad 6$$

If the velocity V_F of the film is controlled by a cable around a cam also moving with angular velocity ω, the linear velocity of the film is $V_F = \omega\ r_C$ where r_C is the effective radius of the cam when T is passing through the x-ray beam.

For image formation $V_F = V_I$ or

$$\omega\ r_C = \frac{SF}{SR + r_T}\ \omega\ r_T \qquad 7$$

$$r_C = \frac{SF}{SR + r_T}\ r_T \qquad 8$$

This equation gives the required effective radius r_C at any point on the cam to provide a sharp image of any point T on the subject at a distance r_T from the axis of rotation. In the design of the actual cam, the geometry of the machine and of the cam, which affects the point of contact of the cable and the cam, must also be taken into account.

A point, T_δ, at a distance $r_T + \delta$ from the axis of rotation will project a line rather than a point on the film as it passes through the x-ray beam. The length, Δ, of this line which determines the sharpness of the image can be calculated by comparing the relative positions of the film and image when the image of point T_δ is at F and when the image of this point is at the edge of the slit.

When the image, I_δ, of point T_δ is at the edge of the slit:

$$\frac{(r_T + \delta)\sin\phi}{SR + (r_T + \delta)\cos\phi} = \tan\alpha \qquad 9$$

Considering $\cos \phi = 1$ and $\sin \phi = \phi$, since ϕ is small:

$$\phi = \frac{(SR + r_T + \delta) \tan \propto}{r_T + \delta} \qquad 10$$

The distance FI_δ, when I_δ is at the edge of the slit, can be written

$$FI_\delta = SF \tan \propto \qquad 11$$

Since I_δ and I will both fall on F when $\phi = O$ and since the movement of the film is synchronized with the movement of I, the length Δ of the projection of I_δ on the film is equal to the distance between I_δ and I when I_δ is at the edge of the slit. From equation *2*:

$$FI = \frac{SF\ r_T\ \phi}{SR + r_T} \qquad 12$$

Substituting from equation *10*:

$$FI = \frac{SF\ r_T\ (SR + r_T + \delta) \tan \propto}{(SR + r_T)(r_T + \delta)}$$

$$\Delta = FI_\delta - FI =$$

$$\frac{SF \tan \propto (SR + r_T)(r_T + \delta) - SF\ r_T\ (SR + r_T + \delta) \tan \propto}{(SR + r_T)(r_T + \delta)}$$

$$\Delta = \frac{SF\ SR\delta \tan \propto}{(SR + r_T)(r_T + \delta)} \qquad 13$$

From this equation it can be seen that the sharpness of an image at a distance δ from r_T is proportional to SF tan $\propto$, which is one half the slit width. Thus, the importance of the slit width in determining the sharpness of the image is apparent. The slit must be narrow enough to provide sharp images of the structures of the dental arch and at the same time must be wide enough so that the shadows of structures not on the dental arch will be blurred to such an extent that they do not interfere with the desired images.

The length on the film of the image of a point at a distance $r_T + \delta$ from the center of rotation can be calculated by substituting numerical values in equation *13*. The approximate values for the present panoramic x-ray machine are as follows:

SF	425 mm
SR	298 mm
RF	127 mm
r_T	50-60 mm
FE	3.75 mm
tan α	0.00882

Substituting in equation *13* and assuming $r_T = 55$ mm, values for Δ can be determined. Since the equation gives the value for image movement from the center to the edge of the slit, the total length of the image is equal to 2 Δ. Calculated values are given below:

δ	2 Δ
1 mm	0.11 mm
5 mm	0.53 mm
10 mm	0.97 mm
–10 mm	–1.41 mm

PROTOTYPE MACHINE

Construction. As now constituted, the panoramic dental x-ray machine is shown in figure 2. A Fischer Model ANM bedside radiographic machine base, controls, and self-contained tube-head transformer combination were incorporated in the new device. The x-ray source and film-holding mechanism are suspended from a movable arm which pivots about an axis secured to a large, fixed, horizontal support arm extending out from the main support column.

A reversible motor with reduction gearing is coupled through a magnetic clutch to a pulley and belt system to drive the movable arm about the support axis. Movement is controlled by mechanical stops, permitting about 200° of total rotation, and a reversing-switch automatic-stop device which automatically stops the machine at the end of one half-arch exposure and reverses polarity to the motor as the machine is moved by hand to the opposite side for the second half-arch exposure.

Immediately below the axis of rotation is a four-lobed cam which, with its cable drive, moves the film inside the holder at the proper rate to secure exposure of the desired structures.

Regular medical x-ray film is placed in a cassette with intensifying screens and inserted into the film carriage in the film-holding element of the machine. The carriage is constructed to roll on a horizontal track inside the film holder so that the entire

film can pass a vertical slit in the center of the front face of the film-holder housing. This face, which is toward the x-ray source, is lined with lead, and only those x-rays passing through the vertical slit can reach the moving film. Fogging due to secondary radiation is reduced in this manner.

X-rays emerging from the source carried at the end of the movable arm opposite the film holder are confined by means of a lead slit so that a narrow vertical beam is projected. This beam passes directly through the subject and falls on the opening in the face of the film holder. Objects in the beam path project shadows on the film in proportion to their relative radiopacities, as is the case in all x-ray exposures.

Operation. The subject is seated and his head is positioned by means of a chin rest so that the axis of rotation of the machine falls at a point just medial to the angle of the mandible on the side opposite that to be radiographed. The head is also tilted forward so that basal skull shadows will not fall in the area of the teeth but will be projected higher on the film where they will not obscure detail in the dental structures.

The movable arm is swung to the extreme limit of its travel so that the film holder is now near the teeth and jaws of the side to be radiographed. The machine is energized and the x-ray beam sweeps about the rear of the head, from about the posterior border of the ramus of the mandible on the side opposite that being radiographed to a point just lateral to the vertebrae of the neck. At the same time the film holder has moved from its position at the start of the exposure, near the molar tooth region, to a position near the incisor teeth of the side of the dental arch being radiographed. Following this, the patient's head is moved to orient the opposite side of the arch, the machine is swung manually about its axis to reposition the x-ray tube and film holder, the machine is again energized, and the second half-arch is exposed.

Time required totals 40 seconds for the two exposures, and it is anticipated that, once the technic for using the machine is perfected, an experienced operator should be able to take full-mouth radiographs in three to five minutes.

Adequate density has been obtained in adult human dental radiographs using x-ray tube voltage and current of 65 kv. at 10 milliamperes. Patient radiation at various points in and about the head is reduced in this method of radiography due to the fact that a narrow beam of x-ray is used and repeated exposure of the same area does not take place as it does in conventional dental radiography.[10]

RADIOGRAPHIC RESULTS

Radiograms of the entire dentition as well as the body and ramus of the mandible and the bony structure of the mandible and

Figure 3. Reproduction of full-mouth survey.

maxillary regions are produced (fig. 3). The presence of impacted or unerupted teeth or retained roots is shown and the general status of the alveolar bone is revealed. Fillings, bridges, et cetera, are shown, as is caries in cases where penetration of the enamel has occurred. Information recorded is believed sufficient to establish many facts of value in mass surveys and for specialized applications in prosthetic and surgical diagnosis. If further detailed spot films are required, these can be made as needed. The panoramic machine is not designed to supplant the conventional technic where the recording of extreme detail is necessary.

SUMMARY

A panoramic dental x-ray machine for use in mass surveys and examinations has been developed and a prototype constructed. This device produces full-mouth dental radiograms on a single 5- by 10-inch film using an extraoral technic. Patients are positioned either seated or standing, beneath the moving arm of the machine, which carries an x-ray source and film holder. Rotation of this arm about its axis sweeps the x-ray source and film about the patient's head, producing a projection of the desired tooth images on the moving film. An exposure time of approximately 20 seconds is required for each side of the arch. Adequate detail is secured to obtain a diagnosis of general mouth conditions. The panoramic dental x-ray device is not designed to supplant the conventional dental x-ray machine in cases where extreme sharpness and detail must be obtained.

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Figure 3. Reproduction of full-mouth survey.

TECHNIC OF CREMASTER MUSCLE DISSECTION IN INGUINAL HERNIOPLASTY

FELIX P. BALLENGER, *Captain, MC, USN*

THE PROPER method of dissecting the cremaster muscle when performing inguinal hernioplasty has been little discussed, yet in many cases it presents a real problem if an adequate repair is to be accomplished. In performing inguinal hernioplasties, and also when observing other surgeons performing this operation, I have noted difficulty in accurately suturing the fascia of the transversalis muscle to the shelving border of the inguinal ligament about the spermatic cord at the internal inguinal ring when the usual methods of dissection of the cremaster fibers were used. If the cremaster fibers are split in the line of their descent, or if they are allowed to continue to encircle or cover the cord structures in any manner, they will invariably obstruct the proper placement of sutures about the spermatic cord at the internal inguinal ring.

OPERATIVE TECHNIC

In order to avoid the difficulties created by the presence of the cremaster muscle in this part of the repair, I have developed a technic for dissection in this region which completely removes the obstructions caused by the cremaster fibers, and also, in cases of recurrent hernia and large hernia, obviates excision of the cremaster in order to accomplish adequate repair. The following technic for dissection and repair of an inguinal hernia is therefore recommended, as I have used it in a large number of cases with invariable ease of suture placement and excellent results.

1. The usual inguinal skin incision is made.

2. The external oblique fascia is incised and opened in the line of its fibers into the apex of the external inguinal ring. This incision is carried about one and one-half inches above the internal abdominal ring and well down over the pubic tubercle in the external spermatic fascia.

3. The cremaster fibers are dissected free from the inguinal ligament from the pubic tubercle to one inch above the internal

From U. S. Naval Hospital, Quantico, Va.

abdominal ring (fig. 1). It is important in this dissection to see that all fibers are completely detached from the inguinal ligament.

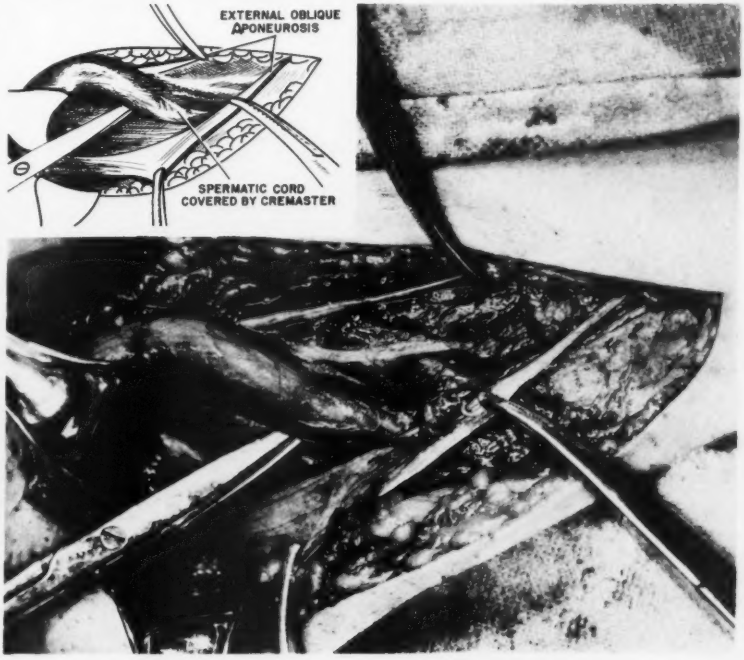

Figure 1. Beginning the dissection of the cremaster muscle. The point of the scissors is shown under the lower edge of the cremaster; at this site the cremaster is detached from its origin.

This lower border of the cremaster is then elevated and the dissection continued to elevate the cremaster muscle in its entirety from the external spermatic fascia and underlying cord (fig. 2). The entire cremaster, including its origin from the internal oblique muscle, is then retracted upward. This exposes the spermatic cord covered by the internal spermatic fascia (fig. 2).

4. The spermatic cord and its internal spermatic fascia covering can then be dissected completely free from the floor of the inguinal canal from the internal abdominal ring to a point below the pubic tubercle. When this has been accomplished all areolar tissue is removed from the inguinal canal and its floor (fig. 2).

5. The internal spermatic fascia is then incised in a line with the spermatic cord and the hernia sac can easily be brought up, dissected out completely, its neck transfixed and ligated high inside the internal abdominal ring, the sac excised, and the stump

allowed to retract upward. If, however, a direct hernia sac is present, it can be handled by whatever method seems appropriate such as dissection, high ligation, and excision or by imbrication and infolding.

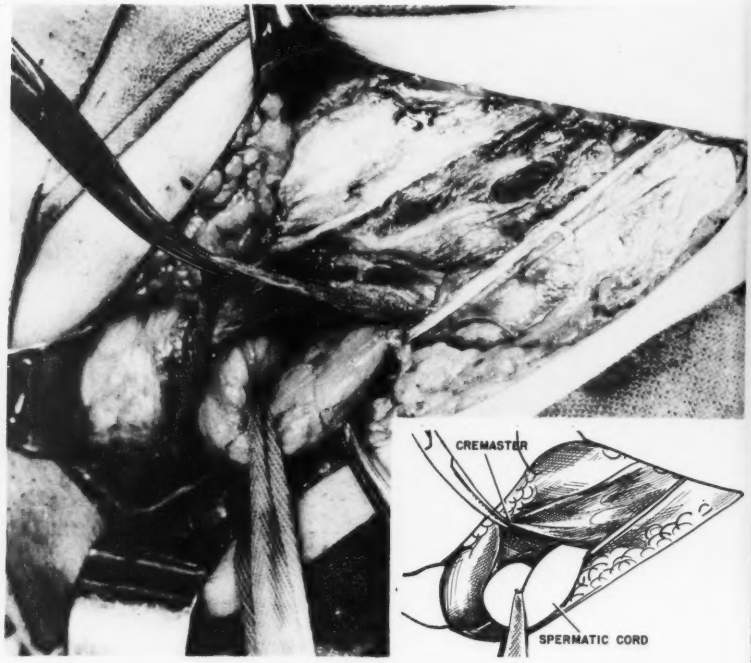

Figure 2. The cremaster has been elevated from the cord and the cord dissected from the floor of the inguinal canal.

6. After the sac, or sacs in the case of a "Pantaloon" type, have been adequately removed or imbricated, the repair can then be proceeded with. The transversalis fascia is secured in the floor of the inguinal canal with Allis forceps, and the border of the transversalis fascia is sutured to the shelving border of the inguinal ligament with interrupted No. 00 cotton sutures (fig. 3). The sutures are placed from the medial angle lateralwards, being certain to secure the first suture into the fascia overlying the pubic tubercle. As placement of the sutures upward and outward proceeds, it becomes obvious that they can be placed on either side of the spermatic cord at the internal abdominal ring with ease without incorporating fibers of the cremaster muscle, because the cremaster and internal oblique muscles are now being retracted upward completely out of the way (figs. 3 and 4). By placing 6 to 8 sutures below and medial to the cord and 2 or 3

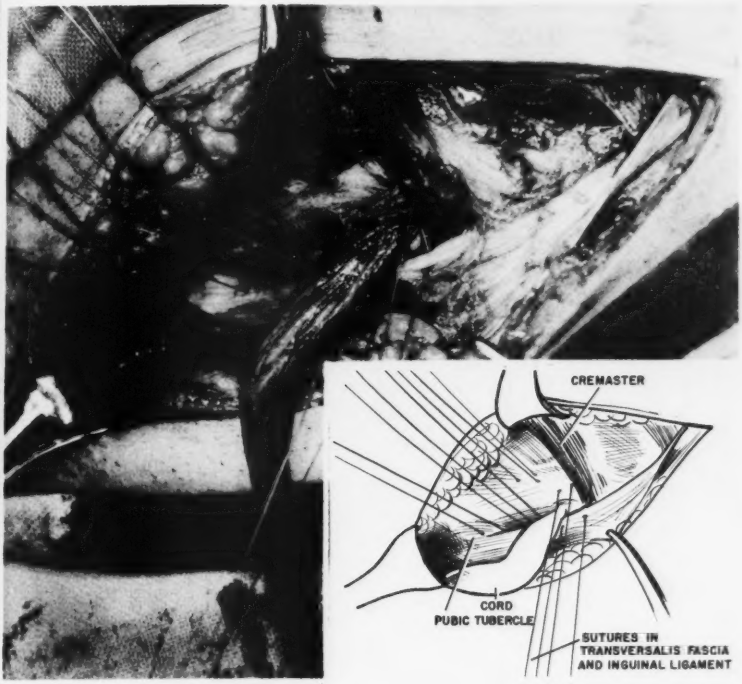

Figure 3. Retraction upward of cremaster muscle permits easy placement of sutures in transversalis fascia and inguinal ligament.

above or lateral to it, a snug repair around the spermatic cord usually can be obtained. In infants and children this layer of repair is not necessary and is omitted. I believe that many recurrences of indirect inguinal hernias occur because of inaccurate placement of sutures and failure to secure an adequate, snug repair about the spermatic cord. This defect can easily be avoided by using this technic of dissecting the cremaster and repairing the floor of the inguinal canal.

7. The spermatic cord is then replaced in the inguinal canal and the cremaster replaced over the cord and sutured to the inguinal ligament in its normal anatomic relationship (fig. 5). However, if it is thought desirable, the cord can be transplanted completely to the subcutaneous tissues in the Halsted repair. If the cord is replaced in the canal and the cremaster sutured over it as above described, the external oblique fascia and external spermatic fascia are then closed with interrupted No.

0000 cotton sutures and the subcutaneous tissue and skin closed with the same material. If the Halsted procedure is done the external oblique fascia is sutured beneath the spermatic cord,

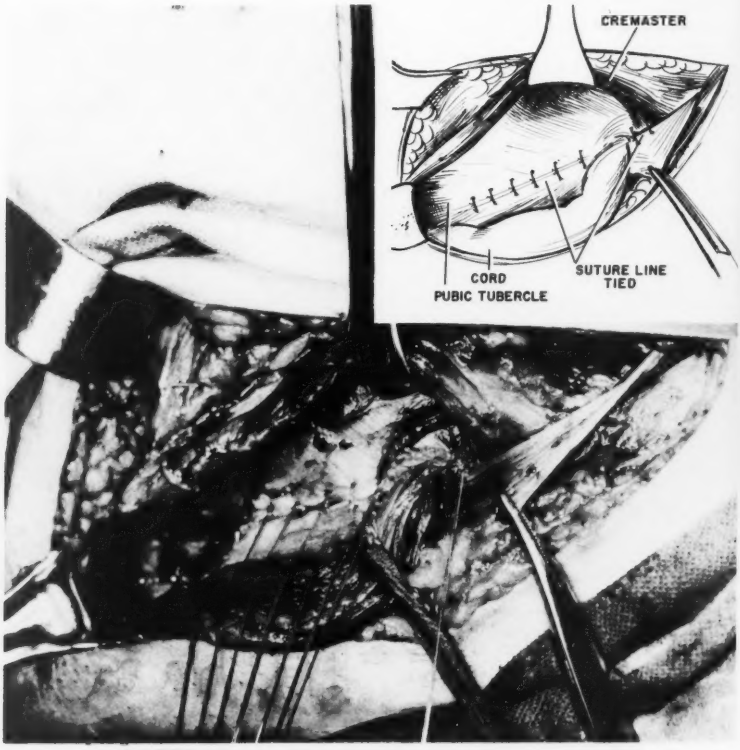

Figure 4. All sutures have been tied, apposing the transversalis fascia to the inguinal ligament.

allowing the cord to emerge through this suture line at a point about one-half to three-fourths inches lateral to the internal abdominal ring. A bed of subcutaneous tissue is then sutured underneath the cord, between it and the external oblique fascia, and subcutaneous tissue and skin are closed over the cord, using No. 0000 cotton sutures throughout.

SUMMARY

A technic for dissecting the cremaster muscle from the external spermatic fascia and spermatic cord and retracting it upward along with the internal oblique muscle allows easier placement

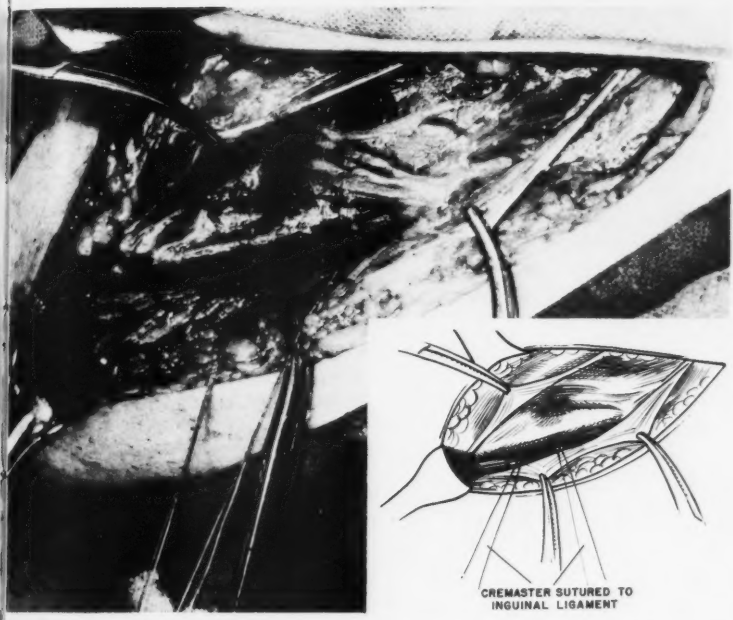

Figure 5. The cremaster has been replaced over the cord in its normal anatomic position, and is shown here with its lower border resutured to the inguinal ligament.

of sutures in the transversalis fascia and inguinal ligament. This technic obviates the incorporation of the cremaster fibers in the suture above and lateral to the spermatic cord and, I believe, makes a more accurate and stable repair of this portion of the inguinal canal floor.

This article is reprinted from the November 1956 issue of this *Journal*, because a printing error had robbed the illustrations of some of their effectiveness in giving the reader a clear understanding of the important new technic described.—*Editor*

THE PASSIVE-AGGRESSIVE PERSONALITY

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ALTHOUGH the passive-aggressive individual is not well described in the psychiatric literature, he is encountered with considerable frequency at military sick call. This chronic complainer presents knotty problems in medical administration, and his treatment and disposition provoke considerable tension. Before enlarging on the nature of these difficulties and presenting suggestions for the management of the recalcitrant patient, a brief review of the features of this character disorder is in order.

According to Hodge,[1] "The passive-aggressive character is the man you don't like." This is the ideal summation. The unpleasantness of this type of personality prompted H. G. Wells to refer to such people as "common humanity unmitigated." They are chronic complainers who imply that their medical problems are largely unappreciated and that the physicians have acted in a thoroughly incompetent and poorly intentioned manner. Beneath a thin veneer of reluctant courteousness, their attitude of surliness puts other people on the defensive.

The actions of the passive-aggressive individual are characterized by an angry reluctance and a calculated inefficiency. He grumbles and protests, he procrastinates, but he does not openly accuse or rebel. He appears pained by his work, his position, his general circumstances, and his ailments. He will never admit to enjoying himself despite the fact that someone might actually catch him in the act. His whole life is one of dedicated suffering for which he feels other people are wholly responsible. The passive-aggressive personality makes innumerable demands which when gratified result not in pleasure but only in more demands and new conditions. He resents everything (even himself) and verbalizes the conviction that life holds nothing for him and that he might as well be dead. But because he disguises his expressions of hostility, he cannot be openly accused of disobedience.

From the military point of view, this cantankerous attitude often takes the form of a marked reluctance to work, which the offender

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frequently bases on a deep and sincere conviction that he is incapacitated by some illness such as excessive and intractable headaches, extreme anxiety, "bad feet," or varicose veins which prevent walking, marching, or working. The tendency of such individuals to "black out" is probably an exaggeration of a mild spell of vertigo. Passive-aggressive personalities are very quick to use such a symptom as "blacking out" in an effort to convince their superiors that it is unsafe to use them in a job where such a spell might endanger their lives or those of their shipmates.

Usually the passive-aggressive personality is regarded as a rather unwelcome member of any military group, and his superiors are prompt in transferring him to some other unit to rid themselves of an "unwilling dragon." His friends tend to react in a similar manner, since his social relations can be described by the phrase, "Whom he loveth, he chasteneth." In summary, the passive-aggressive character is surly, complaining, tends to procrastinate, and implies that other people are treating him badly. This man is not a malingerer but rather a person who has minimal complaints which he over-exaggerates and to which he is helplessly compliant. Despite his undeniable unhappiness he is basically as competent as most other men, yet his production is far below average. He suffers from poor motivation rather than from physical or emotional incapacitation.

Generally there are a succession of events which occur in the military career of a passive-aggressive individual and finally bring him to the psychiatrist's office. The first step in this direction frequently is taken aboard ship where it is noted that the man seems to be excessively nervous and ill. With all good intentions, his corpsman frequently refers him to sick call, either at sea or at a nearby shore-based dispensary, for an evaluation of his excessive headaches or anxiety. The man is seen by the medical officer, who makes an honest attempt to treat him by means of accepted recommendations and medications. The patient will not accept this advice and generally returns to sick call on several subsequent days complaining that whatever has been recommended has been to no avail and that his condition is largely intractable. Accordingly, the medical officer feels that this intractable patient should perhaps be seen by a specialist and refers him to a nearby hospital for consultation. In the hospital the same pattern of events is repeated; the man is given specific treatment and equally specifically fails to react. At this point he is referred for neuropsychiatric consultation because of his excessive concern for symptoms that cannot be clinically substantiated. Medical recommendations result in a long series of impasses because the passive-aggressive patient expects and then demands some type of magical cure. If this is not forthcom-

ing in the hospital, he frequently seeks advice on the outside from an osteopath, a chiropractor, or "faith healer." Finally, the specialist in the hospital reaches the point where he feels that nothing can be done for this patient, and the man is discharged to duty "under duress." He then may write to his mother for redress or to his Congressman demanding an "investigation" of alleged flagrant professional incompetency.

HOSTILITY

In order to clarify why this particular individual demands such minute medical attention it is necessary to return to his basic personality structure and consider what effect it has on other people. Beneath his veneer of courteousness, the passive-aggressive character is deeply hostile. If the physician is not aware of this, resentment or tension may develop within the doctor who is dealing with such a character disorder. The first person to fall into this particular trap is the corpsman who is attached to the man's unit. Due to the anxiety that is provoked by the man's repressed hostility, the corpsman's first impulse is to try to rid himself of the passive-aggressive patient. Although he may be convinced that this patient is not excessively ill and does not require further medical attention, the patient usually demands further treatment. To avoid further useless discussion, the corpsman's tendency is to relieve himself of his tension by passing the patient on to the medical officer, whose immediate inclination is to please the patient's demands as much as possible. If the doctor attempts to explain to the patient the nature of his symptoms, suddenly the situation becomes more complicated and the medical officer finds himself involved in a highly personalized situation, to the delight of the passive-aggressor. Perhaps without his being aware of it, the physician's own hostility is activated by the basically hostile attitude of the patient. This frequently produces a "guilt complex" in the medical officer when he finds himself actively disliking a patient. To remove the cause of his "guilt," his tendency is to pass the patient on to some other physician, preferably by the technic of a "consultation." And so the medical merry-go-round gets underway, affording the patient an ideal opportunity to play both ends against the middle, and vice versa, much to the delight of his ego!

Passive-aggressive personalities are very difficult to stand up to because they are basically unreasonable and because their hostility tends to activate anxiety in others. The man's behavior is such that he appears to most lay people as definitely being a sick man. The physician naturally feels that to be firm with such an individual and force him to return to duty might in some way appear to observers as being hardhearted. Because of his own fear of arousing hostility in the patient, his inclination is to refer

him to someone else. Thus we see that both the corpsman and the medical officer tend to follow the path of least resistance in ridding themselves of the passive-aggressive patient by complying with his demands and usually passing him on for further medical considerations.

Passive-aggressive personalities frequently exhibit very strong urges toward earning attention and demanding retirement from military service on the basis of their so-called disabilities. They are able to persist and will go to elaborate lengths in attempting to gain these ends. Occasionally they are successful, but their success is both a burden on the taxpayer and a travesty of justice. Hospitalization of these individuals is a needless and inexcusable expense. To the cost of his hospitalization is added the fact that the man is not producing anything while he is on the sick list, so that in the last analysis the cost of caring for such an individual far outweighs any monetary value of his wholly unsatisfactory military service.

It is of interest to note some of the implications of this pattern of events that takes a man from his work, puts him on the sick call, and finally refers him to a nearby medical center for examination by specialists. The first consideration is the fact that this man tends to lose a great deal of time from his work and that facilities, such as transportation, are required to move him around to the various points of medical examination. This "special attention" is a form of notoriety which the passive-aggressor soaks up like a dry sponge. Such demeanor in the long run has a bad effect on the morale of his shipmates because it puts the medical department in a bad light and leads his shipmates to believe that they, too, can "get away with it."

EFFECT ON GROUP MORALE

The greatest difficulty in dealing with such a man is the fact that he can influence morale in his unit by impugning the motives of other people. He can very cleverly inject a quality of caustic wit into his remarks that makes his shipmates feel guilty for their enthusiasm for their work. The man tends to make all duty aboard ship seem rather ridiculous and implies that anybody who is willing to do it is a fool. Such an individual has a diabolical ability to kill or to cripple group morale. He then gloats over his destructive prowess and looks about for new fields to confuse and conquer.

Generally, the passive-aggressive personality is quite clever in using his complaints to create friction between the medical department and the people who command the various units. This friction frequently comes about because the office, ship, barracks, or battalion would like to be rid of this reluctant worker and chronic

complainer. Yet, the medical department insists that the man is well enough to work and sends him back to duty. This also creates rather bad personal and public relations among the men since the passive-aggressive character takes the attitude that he is being forced back to duty despite the fact that he is obviously a sick man. Because of the persistence of such an individual's complaints, frequently considerable sums of money are expended in assuring him that he is getting a really fair examination before being forced back to duty. Unfortunately, as these antics continue, the man becomes increasingly aware of the advantage he holds. He constantly leans toward being ill and shows whenever possible, that he is basically unable to work. The man is aware that the weight of opinion among the crew is on his side and to a certain extent this makes it more difficult for the officers aboard the ship to enforce discipline. His all too obvious suffering implies that the officers are callous and unappreciative of the fact that he is ill. The man, therefore, becomes a morale-breaker by assuming an attitude of righteous indignation and hostility toward the military service in general and against the military medical department in particular. Finally, this may result in expensive litigation and demands for a pension even after he has been discharged from active duty.

PSYCHODYNAMICS

Dynamically, most of the character traits in this disorder seem to stem from only a few sources. One is a deep disappointment in love which the individual suffered at a very early age. His provocative behavior probably was originally directed toward that parent to whom he was most attached, but who failed to reciprocate his feelings. These provocations, in some dim animal way, were intended to elicit an affectionate response from the love object and at the same time to express strong hostility associated with the frustrating situation. Such a child also feels (without the capacity to intellectualize it) that the overt expression of love from the parent considerably reduces the state of tension and anxiety which the individual is chronically burdened with. Unfortunately, with the passage of time, the individual's demands for affection become so exaggerated that there can be no appeasement, which naturally leads to further tension, frustration, and provocative behavior in that order. Thus, the man's adolescent behavior becomes deeply consolidated in his character structure and serves the dual functions of defense and gratification. The defense function would be the petulant conviction that he is abused, thus warding off the feeling of his deep need to be loved, and the gratification is the chronic disguised expression of hostility that arises because of his frustrations.

TREATMENT AND DISPOSITION

Every patient who comes to the dispensary or sick call is certainly entitled to a medical examination regardless of his character structure or defects previously entered in his health record. It is always important to bear in mind in these cases that men with psychologic problems can also have a definite organic illness. Thus, the passive-aggressive's backache may occasionally turn out to be caused by a kidney stone or some related pathologic process. Therefore it is important to record as clearly as possible the results of the physical examination. Once a passive-aggressive personality has had his physical complaints evaluated, he should not be referred for further examinations by specialists or hospitals unless such examinations are definitely needed. At this point it is of vital importance for the medical officer to have the courage of his clinical convictions and not refer the man for further examinations just to be rid of him. An unwarranted consultation may consolidate the man's complaints and convince him irrevocably that he really is ill and that he has received inadequate or shabby treatment. Sooner or later he must be told quite firmly that he is fit for full duty and returned to it immediately. At times, this is very difficult to do in the presence of his manifest suffering, even though it be more apparent than real.

Because of the tendency of the passive-aggressive personality to seek litigation and to complain to people in high political positions, the medical officer's record of clinical findings and therapy should include an opinion as to whether or not the man is fit to return to duty. Generally, passive-aggressive personalities are very quick to use their medical records in the further elaboration of their complaints. They have a morbid interest in their health records as a springboard from which to launch their attacks on the integrity of the Medical Corps or even on the efficiency of the Navy as an organization vital to the defense of democracy. One cannot necessarily regard their attitudes as those of malingering because these men have convinced themselves that they are ill and that they are not being adequately treated.

Once the medical officer has firmly insisted that the man return to his duty, very often the patient will be openly hostile to the physician. Occasionally, such a passive-aggressive personality will react with apparent pleasure to the fact that he is being forced back to work. Dynamically, this pleasure is the result of a reduction in over-all tension as a consequence of his hostility now being concentrated on the physician, who by his firmness has become the target for the patient's vituperation. This reaction represents a somewhat masochistic component of this defect in character structure. Generally, when a man is forced to return to

full and active duty, it is necessary to notify his commanding officer of the circumstances and assure him that the man is fit. Returning a man to duty under these circumstances puts him in a position of facing disciplinary action for his continuing failure to work. Because passive-aggressive personalities realize the imminency of punishment and seek to avoid overt conflict, they respond quite favorably to this type of situation. Provided one discounts their grumbling, they seldom get into trouble once they are made to realize that the "chips are down." Although ordering him back to duty may appear to be a rather hardhearted solution of his medical problems, it is the only salutary action. Whenever possible, it is a good idea to see these men for a few follow-up sessions in psychotherapy.

All that one can hope to accomplish in a short-term psychotherapy is to transfer the petulance and provocation (which are sadistic aggressions turned inward) into overt, outwardly directed hostility. This disturbs the economy of the symptom (or system) in terms of ego-function by disrupting its equilibrium. The patient dissipates tension by being outwardly angry with the physician and begins to feel the difference between this and his usual petulant and procrastinative behavior. This is probably the reason why some of these passive-aggressives react favorably to the physician's firmness on sick call—they overtly become angry with him and this relieves tension to some degree. Thus, pleasure and pain become juxtaposed in their functioning. The passive-aggressive reacts to other people's anger and irritation as if it were an expression of affection. This is probably related to childhood experiences in which the two were closely associated, for example, a hearty spanking being followed by expressions of affection.

During these psychotherapeutic interviews, the passive-aggressive continues to be extremely complaining. Whatever suggestions are made are met with a series of impasses constructed by the patient as defense or escape mechanisms. Generally, there is no apparent progress during psychotherapy, but the clinically oriented psychiatrist notices that the patient seems gratified by the attention he is receiving from the physician. Once dealt with firmly, the patient becomes more tractable about returning to work. One finds by calling his ship that he is relatively happy and productive, although he will never admit that he is feeling better. Always with this type of personality, bluntness is the best mode of approach or attack. Once a concession is made, the floodgates are opened to a veritable deluge of demands for additional concessions. It is dangerous to spar with a passive-aggressive patient. The only hope of success is to be completely candid and almost brutally frank.

Hospitalization of such individuals defeats its own purpose because it affords them a golden opportunity to consolidate their

complaints and provocative behavior. These patients are chronic "sufferers," and they rarely feel that there is anything bright in their future. Because of these attitudes these men make relatively little progress when assigned to a psychiatric ward, and almost invariably they collapse as soon as they have been discharged from the security of the hospital. They cannot make a satisfactory adjustment to the facts of life nor adequately cope with the stresses and strains of the social structure because they are their own worst enemies.

If the individual with a fixed passive-aggressive personality is basically intractable and cannot be returned to duty despite all his numerous complaints, it may be necessary to separate the man from military service for the "convenience of the Government." Even the threat of disciplinary action may fall on deaf ears, in which case the man remains a very reluctant worker and is a chronic thorn in the side of the people who are trying to run the organization. Because of his low morale, he remains an unproductive worker, which of itself is evidence that he is psychologically unfit for military duty.

CONCLUSIONS

In the last analysis the basic trouble with such a passive-aggressive personality is that the man has extremely poor motivation. He uses elaborate symptoms as an excuse for his failure to adjust to military service, and he places the blame on "the brass" in general and the medical officer specifically. People who are unenthusiastic and recalcitrant simply do not belong on the varsity squad. Ideally, they should be kept out of the service whenever possible. However, such a person, when appearing for his premilitary screening, very often seems enthusiastic about military training. Such enthusiasm, however, is short-lived, once the initial glamor has faded and the "heat is on." Since the recruit tends to keep his character traits in abeyance during his initial interview, the first examiner has no way of really demonstrating the underlying character defect. Once on active duty, however, the passive-aggressive soon reveals his surly behavior, his preposterous complaints, his irascible, cantankerous attitude, and his reverse negative motivation.

The only way to deal with passive-aggressive personalities is first to rule out the possibility of any definite organic lesion as a basis for their "symptoms." Then they must be firmly returned to duty rather than referred for further examinations and hospitalization, which are and would continue to be entirely unwarranted. If the individual persists in his recalcitrancy, he should be separated from the military service without benefit of retirement for physical or mental illness.

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Clinicopathologic Conference

Brooke Army Hospital, Fort Sam Houston, Tex.*

ADRENAL INSUFFICIENCY, QUADRIPLEGIA, AND COMA

Summary of Clinical History. A 64-year-old white male retired Army officer had been in apparent good health until September 1949, at which time he developed bloody diarrhea and fever while traveling in Mexico. Following recovery from this illness he began to have weakness, easy fatigability, nervousness, and difficulty with co-ordination. In July 1950 he was admitted to an Army hospital, and diagnoses of toxic hyperthyroidism, hookworm disease, and chronic laryngitis were made. Each of these entities responded well to treatment, and the patient was discharged on maintenance propylthiouracil therapy. Outpatient urologic evaluation because of urinary frequency resulted in the diagnosis of benign prostatic hypertrophy and a recommendation for transurethral prostatic resection. The patient declined an operation and was followed in a civilian clinic during the latter months of 1950. There it was felt that many of the patient's complaints were on a functional basis. Benign rectal polyps were discovered, however, and these were fulgurated. He was admitted to a civilian hospital in December 1950 with the chief complaints of weakness and nervousness. Because of additional complaints of tibial pains and the discovery of consistently elevated acid phosphatase determinations (10.5 to 12.5 Bodansky units), he was transferred to an Army installation for further evaluation on 3 January 1951. Within nine days after admission to the Army hospital progressive nausea, vomiting, and hypotension developed, and

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for the ensuing month the patient received supportive therapy, penicillin, and Doca Acetate (brand of desoxycorticosterone acetate). On 16 February the patient began to have daily febrile episodes, to 100° or 101°F. Blood pressure remained at about 66/30 mm Hg. Adrenal cortex extract and cortisone were then administered daily as well as maintenance doses of Doca Acetate, and marked clinical improvement occurred within the next six days. Thereafter the patient was maintained on daily Doca Acetate and cortisone; he was discharged from the hospital on 3 July on these drugs, along with supplemental salt and testosterone. Pertinent laboratory studies during this period of hospitalization indicated persistently depressed serum sodium determinations (125 to 140 meq/l), an average daily urinary 17-ketosteroid level of 3 mg per cent, an abnormal eosinophil response to corticotropin (ACTH) and epinephrine, positive Robinson-Power-Kepler tests, and a distinctly flattened glucose tolerance curve.

The patient was rehospitalized briefly in November because of frequent bouts of vertigo, tinnitus, and staggering gait. Discharge diagnosis was "eustachitis, acute, improved." In May 1952 he began having generalized convulsive seizures which characteristically lasted for 10 to 15 minutes, were not associated with unconsciousness, disappeared spontaneously, and resulted in brief, postseizure dizziness. His final admission, to this hospital, was on 16 May 1952.

The patient's past, social, and family histories were essentially noncontributory.

Physical Examination. Physical examination upon admission disclosed a temperature of 101.2°F, a pulse rate of 126 per minute, and a blood pressure of 160/90 mm Hg. Significant abnormal physical findings included a barely palpable, nontender liver; a small, firm nodule of the left epididymis; absence of abdominal reflexes; slight motor weakness of the left extremities; and generalized tan hyperpigmentation of the skin and mucous membranes. Save for a mild normochromic, normocytic anemia and a corrected sedimentation rate of 31 mm per hour, admission hemogram was essentially within normal limits. Urinalyses were not remarkable. Electrolyte studies and fasting blood sugar levels were within limits of normal.

Course in Hospital. The clinical impression upon admission was that the patient had sustained a cerebrovascular accident. Because of primary complaints of weakness, daily dosages of cortisone and Doca Acetate were increased. On 25 June the patient complained of hoarseness, difficulty in walking, and unsteadiness while standing. On 6 July bilateral Babinski signs were elicited, and spinal fluid protein level was 111 mg per cent. Shortly thereafter urinalyses repeatedly demonstrated albumi-

nuria, hyaline casts, and microscopic hematuria. Electrolyte studies and leukocyte counts remained within normal limits. On 8 July the patient had a typical left-sided Jacksonian seizure, and spinal fluid studies, including manometric recordings, were normal save for total protein concentration of 110 mg per 100 ml. No organisms could be cultured from the spinal fluid.

Marked weakness of the left extremities, marked apathy, and slurred speech ensued, followed by semistupor on 14 July. Beginning on about 10 July the patient's blood pressure gradually decreased, pulse rate increased, and low-grade fever recurred. Slight nuchal rigidity and flaccid paralysis of the left upper extremity developed. The neurology consultant additionally noted bilateral Babinski signs, right-upper-extremity spasticity, right-sided hyperreflexia, and slight right-facial weakness. Dyspnea and cyanosis appeared on 14 July. For the following two days neurologic findings were exceedingly variable. The patient died in coma on 16 July 1952, almost three years after the initial onset of symptoms.

CLINICAL DISCUSSION

Doctor Hollander:* This patient's difficulties began with diarrhea. If, as we believe, the patient had adrenal insufficiency of prolonged duration, it is possible that this diarrhea constituted the initial symptom. Gastro-intestinal symptoms are often the initial event in the relentlessly downhill course of Addison's disease. It is possible that the bloody character of the diarrhea could be ascribed to the rectal polyps. It is further conceivable that the symptom triad of diarrhea, weakness, and nervousness encountered early in this patient's medical history could be ascribed to hyperthyroidism. Hyperthyroidism is about 10 times more frequent in people with Addison's disease than in people with intact adrenal function.

Two possible explanations for this relationship have been advanced. One can experimentally demonstrate the reciprocal relationship between the adrenals and thyroid by the depression of radioactive iodine uptake by the thyroid following the administration of large quantities of cortisone. Secondly, hyperthyroidism *per se* acts as a stressful systemic phenomenon and forces increased adrenal activity. Clinical evidence of hyperthyroidism abated in this patient. This fact would be of clinical importance in a patient with Addison's disease, since he could not be expected to tolerate well the added stress of thyroid hyperfunction.

I assume acid phosphatase determinations were done because of tibial pains. Since I feel that insufficient practical evidence is present to seriously suspect primary prostatic malignancy, the elevated acid phosphatase levels might occur by either of two mechanisms. First,

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temporarily elevated levels may be obtained if determinations are performed shortly after rectal examination and prostatic palpation or massage. Second, similarly elevated phosphatase levels may be produced by a poorly understood mechanism whereby the blood sample is allowed to stand at room temperature, perhaps for 24 hours or so, before the chemical procedure is started. In a patient with Addison's disease, tibial pains might actually be on the basis of muscle cramps secondary to excessive salt loss associated with increased water ingestion. Co-existing rheumatoid disease might possibly account for these pains. There is a statistically significant co-existence of Addison's disease and rheumatoid arthritis. Rheumatoid disease, however, appears unlikely in the patient under discussion.

The patient's hoarseness merits some comment. Laryngeal muscular weakness commonly is found in patients with Addison's disease. The diffuse hyperpigmentation described in the protocol also appears characteristic of Addison's disease, and we need not seriously consider other differential causes of pigmentation such as hemochromatosis, argyria, acanthosis nigricans, and the like.

Let us review the salient signs and symptoms indicative of Addison's disease. A majority of these indications were manifest in the case under discussion. We may tabulate weakness; easy fatigability; hoarseness; weight loss; dehydration; gastro-intestinal disturbances such as anorexia, nausea, vomiting, and diarrhea; hypogonadism; hyperpigmentation; hypotension; and nervous and mental disturbances. The latter findings are often difficult to evaluate in patients with Addison's disease. The occurrence of psychiatric aberrations is known to most of us, but less widely appreciated are the neurologic findings, including electroencephalographic changes, which occur so frequently and which may simulate localized cerebral or spinal cord disease.

We may postulate that some of the neurologic abnormalities can be attributed to hypoglycemia. Hypoglycemia in degrees ordinarily well tolerated by normal individuals may produce marked neurologic difficulties in patients with Addison's disease. In other words we may say that these people are "hypoglycemia sensitive." Neurologic difficulties may also be ascribed to "wet brain" resulting from adrenal steroid therapy, particularly to Doca Acetate therapy. Lastly, many diseases not uncommonly affecting the central nervous system such as tuberculosis, tumors, cryptococcosis, and histoplasmosis may have anatomically demonstrable adrenal involvement and thus produce the picture of localized central nervous system disease combined with Addison's disease.

The laboratory diagnosis of Addison's disease warrants some discussion. We are all aware of the commonly employed laboratory evidences, such as hyponatremia, hypochloremia, hyperkalemia, hypoglycemia, flat glucose tolerance curve, decreased urinary 17-ketosteroids and 11-oxycorticosteroids, positive Thorn eosinophil test, and positive Robinson-Kepler-Power water loading test. To this list

may be added decreased plasma corticoids, positive salt deprivation test, and increased insulin sensitivity. Other clinically useful diagnostic modalities include decreased cardiac size, abnormal electroencephalographic and electrocardiographic tracings, and evidences of impaired renal function such as decreased renal blood flow, decreased glomerular filtration, and abnormal uric acid excretion. I would like to comment briefly on some of these laboratory procedures in adrenal insufficiency suspects.

Hyponatremia may not be present in patients with Addison's disease, particularly with Doca Acetate therapy. Interpretation of serum sodium levels necessitates correlation with chloride and bicarbonate levels as well as the clinical status of the patient.

Serum potassium determinations in uncomplicated Addison's disease are not of particular diagnostic aid, and levels may be low rather than high in patients receiving Doca Acetate.

Low urinary excretion levels of 17-ketosteroids and 11-oxycorticosteroids are characteristically obtained in Addison's disease. Decreased excretion of 17-ketosteroids, however, may be seen in other debilitating diseases. Low urinary excretion of 11-oxycorticosteroids is not pathognomonic of Addison's disease, since the test widely employed is not entirely specific for these substances.

In the Thorn eosinophil test the use of ACTH yields less inconsistent results than the use of epinephrine. With ACTH, of course, in the presence of normally responsive adrenal glands, a 60 to 70 per cent fall in circulating numbers of eosinophils can be expected. In Addison's disease a significantly diminished eosinophil response is obtained. One word of caution: Commercially available ACTH preparations commonly have significant antidiuretic properties, and injudicious usage may lead to adrenal crisis in Addisonian patients by virtue of prompt water retention and sodium dilution.

Methods for measuring plasma corticoids are now available, and the method of Nelson and Samuels[1] is quite useful. Normal blood values of 4 to 10 μg/100 ml are reported with significantly reduced levels in patients with Addison's disease. In clinically questionable cases of Addison's disease, however, this determination has limited diagnostic value.

Increased insulin sensitivity has been described in patients with Addison's disease. The test is not without hazard, however, since these patients are inordinately sensitive to insulin and may go into irreversible adrenal crisis from the insulin test doses usually employed. An insulin-glucose tolerance test devised by Scott and Engel is a safer diagnostic procedure.

The water loading and salt deprivation tests may induce acute adrenal insufficiency states for diagnostic purposes. These procedures are not worthwhile, in my opinion, in this day when other applicable laboratory tests are available.

In summation, I feel that the patient definitely had adrenal insufficiency or Addison's disease. In view of the neurologic symptomatology and elevated spinal fluid protein, it is my guess that rather diffuse central nervous system disease existed as well. To equate the two major pathologic processes in this patient, namely, adrenal and cerebral disease, we may postulate the presence of a disease process capable of producing these changes, such as tuberculosis, histoplasmosis, or cryptococcosis. I tend to discount the possibility of neoplastic disease with widespread metastases since I have no good indications of a possible primary anatomic site.

Doctor Lind:* Doctor Hollander, you mentioned neurologic findings encountered with Doca Acetate therapy. Did you mean hypertension? To what may cerebral edema be attributed?

Doctor Hollander: I meant severe hypertension, sodium retention, diffuse edema, and cerebral edema. Much of the neurologic picture seen in patients with Addison's disease may well be attributed to Doca Acetate therapy. In a group of 30 patients on whom bilateral adrenalectomy had been performed we have found it necessary to use Doca Acetate only once. Although we appreciate the fact that an occasional patient will require Doca Acetate because of hypotension which can not be corrected by cortisone, we feel that cortisone therapy alone is the treatment of choice.

Dr. Hollander's diagnosis:

Addison's disease, possibly secondary to disseminated cerebral tuberculosis, histoplasmosis, or cryptococcosis

PATHOLOGIC FINDINGS

Doctor Sulak:** Following correlation of clinical and necropsy data, death was attributed to adrenal cortical insufficiency, terminal pulmonary edema and congestion, and acute bronchopneumonia of the lower lobes bilaterally. Approximately three weeks before the patient died, a small, ulcerative lesion of his upper gum was biopsied, and the basic disease responsible for the protean symptomatology was identified.

At necropsy the significant findings on external examination were those of emaciation, diffuse brownish hyperpigmentation of skin and mucous membranes, the healing gum lesion, and a firm 2-cm nodule within the upper pole of the left epididymis.

The most significant gross pathologic changes affecting internal viscera, in approximate order of decreasing severity, were found within the adrenal glands, brain, kidneys, left epididymis, tricuspid cardiac valve, upper gum, liver, spleen, and random abdominal lymph nodes. These changes may be described briefly as solitary and multifocal, occasionally confluent granulomatous nodules with varying degrees

*Col. Carl J. Lind, Jr., MC, USA, then Chief of Laboratory Service.

**Maj. Michael H. Sulak, MC, USA, Laboratory Service.

of caseous necrosis. The adrenals were almost totally destroyed and, at the opposite end of the spectrum, the hepatic, splenic, and nodal lesions were barely discernible by the naked eye. Microscopically these lesions were productive and exudative granulomatous processes produced by minute ovoid intracellular organisms morphologically characteristic of *Histoplasma capsulatum.* Post-mortem cultures of heart blood and adrenal and cerebral tissues yielded characteristic colonies of *H. capsulatum,* and microscopic morphologic features of the cultivated organisms confirmed these observations.

Multiple lesions were scattered throughout the cerebral medullary substance. The largest single lesion measured approximately 2 cm in diameter and occupied the right optic thalamus (fig. 1).

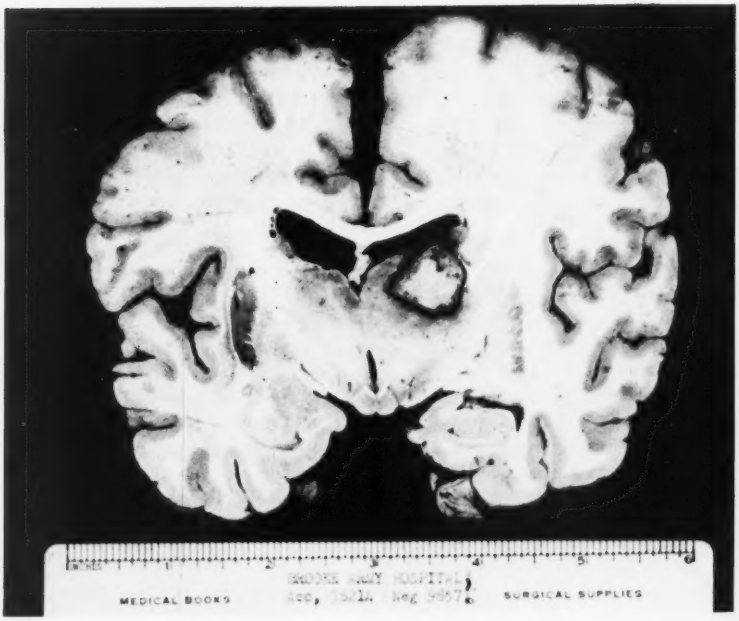

Figure 1. Coronal section of fresh brain at the level of the mamillary bodies, showing granuloma occupying the right optic thalamus.

Oil immersion photomicrographs of tissues stained by the periodic-acid-Schiff technic disclosed myriads of the ovoid, encapsulated organisms measuring 2 to 4 microns in diameter, clustered within macrophages and parasitized parenchymal cells and lying freely in tissues. Figures 2 and 3 show typical fields with adrenal and kidney lesions respectively. It will be noted that in figure 2 empty ring forms predominate.

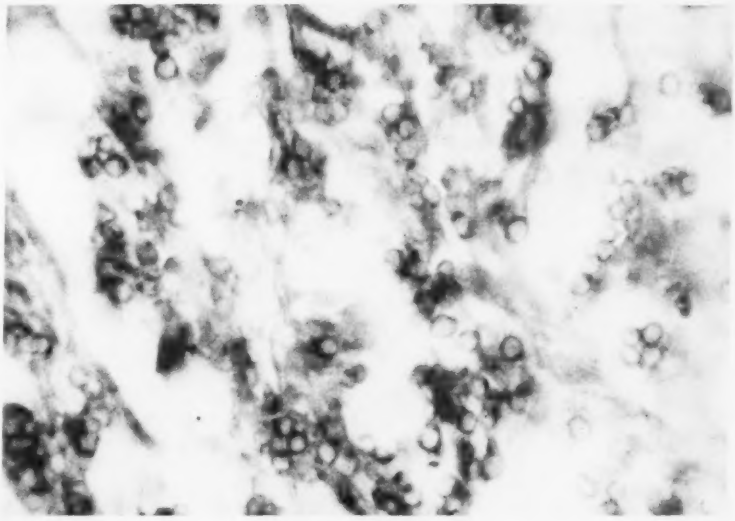

Figure 2. Photomicrograph of an adrenal lesion showing predominantly empty ring forms of H. capsulatum. *(Periodic-acid-Schiff stain, × 906)*

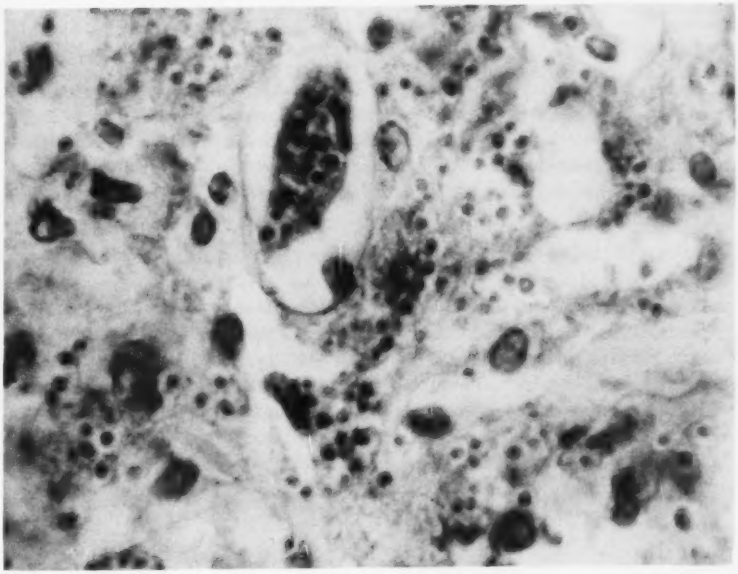

Figure 3. Photomicrograph of a kidney lesion showing large numbers of encapsulated forms of H. capsulatum. *(Periodic-acid-Schiff stain, × 906)*

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Figure 4 shows the microscopic characteristics of the mycelial growth phase of the organism with a feltwork of thin, septate hyphae and the pathognomonic tuberculate chlamydospores, the spore-bearing bodies resembling a medieval mace.

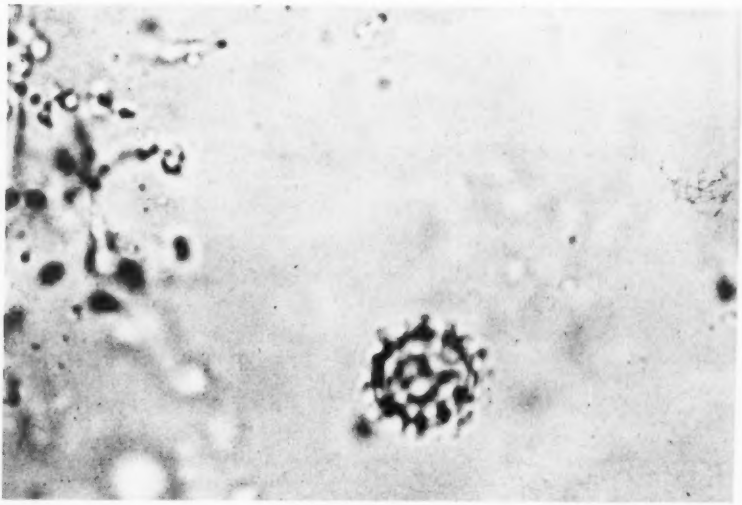

Figure 4. Photomicrograph of culture mount showing characteristic tuberculate chlamydospore of H. capsulatum. *(Lactophenol cotton blue stain,* × *2900)*

If given some degree of scientific latitude, we may say that the diseases histoplasmosis and tuberculosis manifest many strikingly similar clinical and pathologic characteristics. These similarities will become more apparent in a brief discussion of histoplasmosis as an entity of increasing clinical importance, particularly within the United States.

Darling[2,3] in Panama described the first three clinical cases of histoplasmosis in 1905-1907. He felt that the etiologic organism was a protozoan. It wasn't until 1934 that the causative agent was conclusively demonstrated to belong to the *Fungi imperfecti* by De Monbreun,[4] and by Hansmann and Schenken.[5] Until the decade 1940-1950 the disease was considered an invariably fatal systemic process characterized by reticulo-endothelial granulomatosis. During this period, however, an increasing body of critical evidence made it clear that histoplasmosis was much more widespread than had been previously supposed, and that a large endemic area existed in the United States in the area comprising the Mississippi-Ohio valley. Largely through the studies of Nelson,[6] Furcolow,[7] Smith,[8] Christie,[9] and others, it was made increasingly apparent, moreover, that a benign form of the disease was of much greater statistical incidence than the disseminated, fatal variety. Repeated demonstrations of nontuberculous pulmonary calcific

lesions with negative tuberculin and positive histoplasmin skin tests in asymptomatic patients living in the east central United States fostered and fortified this concept of the common benignity of histoplasmosis.

Studies on the epidemiologic aspects of histoplasmosis have yet to demonstrate human-to-human or animal-to-human modes of transmission. Emmons[10] demonstrated the saprophytic existence of the organism in soil in endemic areas, and many different animal species in these areas have been found with the natural infection. The inhalation of air-borne spores is considered to be the means by which humans most commonly come into contact with the infective organism, largely because of the frequency of inactive and healed pulmonary lesions. Much as in pulmonary tuberculosis, reinfection or progressive dissemination may occur, with serious, often fatal consequences.

The reticulo-endothelial system is always affected in the disseminated processes. A granulomatous response is elicited within host tissues with formation of characteristic productive and exudative lesions containing varying numbers of the yeastlike organisms. These changes in tissues represent the yeast or parasite phase of growth of *H. capsulatum,* in contradistinction to the mold or mycelial phase obtained on artificial media at room temperature.

Within recent years the use of the periodic-acid-Schiff staining technic with its several modifications and the use of the Gridley stain has greatly facilitated the histopathologic diagnosis of histoplasmosis as well as other mycotic diseases.

With dissemination of the disease, any and all viscera may become involved. The adrenals, however, almost as commonly as the lungs and reticulo-endothelial structures, are sites of involvement in disseminated histoplasmosis. Accordingly, the syndrome of Addison's disease may often dominate the clinical picture, as was true in the case under discussion today.

Despite the increasing facility of tissue diagnosis by the newer staining technics previously mentioned, I believe that the use of tissue diagnosis to the exclusion of culture studies is undesirable. Inherent in the histologic diagnostic method are several pitfalls. There is the possibility of overlooking the organisms when they are present in small numbers. The very diminutiveness of the organisms leads to confusion with Leishmania bodies and with cellular debris and other artifacts, particularly calcified particles.

Within the past decade, serologic tests for diagnostic purposes have come into existence and are enjoying increasing use. These include complement fixation tests using antigens prepared by various methods, colloiden agglutination, precipitin, and sheep hemagglutination procedures. These tests at the present time appear to have some serious limitations. One of these limitations is the frequent occurrence of cross reactions with blastomycosis and coccidioidomycosis. Never-

theless positive serologic reactions with progressively rising titers in active forms of histoplasmosis are held to be of diagnostic significance by most investigators.

The widely employed histoplasmin skin test is usually interpreted in much the same fashion as the tuberculin test; namely, that a positive reaction indicates past or present contact with the organism and that a negative result is obtainable in advanced cases of histoplasmosis.

Culture of blood, bone marrow, and pertinent body fluids remains our diagnostic procedure of choice. Adequate mycologic diagnosis necessitates growth at 37°C as well as at room temperature with production of both the yeast and mycelial growth phases, respectively. Conversion of one phase of growth to the other is certainly a valuable adjunct to laboratory diagnosis. Blood agar, Sabouraud's dextrose agar, cornmeal agar, and broth are the media most widely employed. Microscopic examination of lactophenol cotton blue culture mounts for morphologic identification is a further necessary step in laboratory diagnosis. Identification of the pathognomonic tuberculate chlamydospores (fig. 4) firmly establishes the diagnosis.

In summation, the major laboratory adjuncts to clinical diagnosis of histoplasmosis are those of blood and bone marrow cultures, tissue examinations, serologic tests, and skin tests.

Finally, with apology to Doctor Hollander since no clues were given in the protocol as to the nature of the disease producing the syndrome of Addison's disease, we may conclude that the patient's major difficulties were produced by widely disseminated histoplasmosis, manifested notably by adrenal and cerebral involvement.

Pathologic diagnosis:

Widely disseminated histoplasmosis with bilateral adrenal destruction and multifocal cerebral lesions

Doctor Lind: Would you say a few words about the status of therapy in histoplasmosis?

Doctor Sulak: Surgical intervention, of course, could be beneficial or curative in anatomically localized lesions. In the three cases of disseminated histoplasmosis at this hospital the vanillate compounds were tried as described in the pediatric literature. These compounds have fungicidal properties and are used in some industries as food preservatives. We had no appreciable success with these agents in these cases. Promin (brand of glucosulfone sodium), stilbamidine isethionate, Atabrine (brand of quinacrine hydrochloride), and most of the antibiotics available to us to the present time have also proved ineffectual. Several reports demonstrating clinical improvement by splenectomy in those patients having hypersplenism have dotted the literature here and there. Immunization procedures have not proved fruitful. In short, no really effective and certainly no definitive therapeutic agents are available to us at the present time.

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GOOD, BUT NOT HELPFUL, ADVICE

The value of the good advice of the physician can be judged by considering the nature of that advice. And it should be observed that in regard to the prevention of heart disease, the advice of the personal physician corresponds to the precepts available for other methods of education and propaganda which might be used in preventive programs. By and large, these precepts are common-sense generalities—"don't overdo things," "practice moderation in all things," "avoid violent emotions," "stop smoking" (maybe), "get a good vacation every year," and so on. These platitudes are harmless and even admirable, but there is not the slightest guarantee of their virtue for the prevention of heart disease.

—EDITORIAL
in *Journal of Chronic Diseases,*
p. 456, Apr. 1955

DEPENDENTS' MEDICAL CARE ACT

PAUL I. ROBINSON, *Major General, MC, USA*

FOR YEARS it has been known that dependents of many active members of the uniformed services were not able to avail themselves of the medical care which was provided in hospitals of the military services. Recently, it was estimated that some 800,000 dependents (40 per cent) were so affected. Care in military and Public Health Service hospitals was rendered on an availability basis, and such care was a privilege and not a right.

In many fields of labor and industry, health plans have grown up during the past several years. A goodly proportion of our citizens provide for their hospital and physicians care by prepaid insurance and health plans. One third of all members of the armed services were returning to civilian life each year, and incentives were needed to stabilize careers.

These facts were taken into consideration in the formulation of a bill concerning which, when he signed it into law, the President of the United States said, "I have today approved with great satisfaction the directive under which the military dependents' medical care program will operate beginning December 7, 1956. Prior to this time, at least 40 per cent of our service families were unable to receive adequate medical care from the Government. This important improvement assures hospital care at all times to the wives and children of active duty personnel. It removes one of the greatest sources of worry to our servicemen and servicewomen around the world.

"A significant new feature of this law authorizes the use of civilian hospitals and facilities for the immediate families of active duty servicemen. The cost to a service family for hospitalization in any facility, civilian or military, will be limited to a payment of either $25 or an amount equivalent to the subsistence charge of $1.75 per day, whichever is the greater. For this charge, all hospital services and doctors' fees for the period of hospitalization are covered. This program also continues the provision for medical care for the dependents of both active and retired personnel in military facilities on a space available basis.

Presented to the Society of Medical Consultants to the Armed Forces in Washington, D. C., on 26 November 1956.

From the Office of The Surgeon General, Department of the Army, Washington 25, D. C.

"I have been personally interested in this important program since its inception. I feel strongly that this important measure will have a far-reaching effect on service morale at home or on our widely flung posts, ships, and bases around the world; and thus effectively strengthens the defense of our country."

The Dependents' Medical Care Act became law on 7 June 1956, to be made effective on 7 December 1956. It provides for uniform medical care for dependents of active and retired members of the Army, Navy, Marine Corps, Air Force, Coast Guard, and the commissioned members of the Public Health Service and the Coast and Geodetic Survey in uniformed service facilities. Dependents of deceased members of any of these services, if the member died on active or retired status, are also eligible for medical care. The Act provides for care in civilian hospitals and by civilian physicians of dependents of active duty members, if they are on active duty for more than 30 days.

It is evident that the program for dependents' care resolves itself into two distinct parts—care in uniformed service facilities and care in civilian hospitals. The uniformed service portion of the program will be administered by the Army, Navy, Air Force, and Public Health Service through their Surgeons General; and is a continuation of programs which have been in force on a less uniform basis for many years. These four services will also operate the civilian part of the program in overseas areas except Alaska, Hawaii, and Puerto Rico.

The administration of the civilian part of the program in the United States, Alaska, Hawaii, and Puerto Rico for all six services has been delegated to the Secretary of Defense who has, in turn, delegated this authority to the Secretary of the Army. Further delegation has been to the Chief of Staff, the Deputy Chief of Staff for Logistics, the Surgeon General, and the Executive Director of the program, which position I hold. The Secretary of Defense and the Secretary of Health, Education, and Welfare have issued a directive that delineates the program in detail and is the basis of operation of my office. The essential provisions of the law and the directive are as follows:

Eligibility. Those eligible are the wives and children or dependent husbands and children of active duty personnel of the Army, Navy, Marines, Air Force, and Coast Guard and of the commissioned members of the Public Health Service and the Coast and Geodetic Survey when on active duty for more than 30 days.

Identification. All of the uniformed services are issuing a new Dependents' Medical Care card. This is to be fully available by 1 July 1957. In the meantime, for those to whom the new card

has not been issued, methods of identification which are in use, plus supplementary information such as driver's license and personal inquiries, will have to be utilized.

The new identification card is to be known as Dependents' Authorization for Medical Care, DD Form No. 1173, and will be the same for all of the uniformed services. One card will indicate the names of all dependents. It will be issued for a maximum of two years, or for a shorter time if a serviceman's enlistment or expected tenure of service is for a shorter time at the time of issuance. Each of the uniformed services is responsible for issuing and discontinuing the cards.

Physician. A physician for this program is "a person who is legally qualified to prescribe and administer all drugs and to perform all surgical procedures." Included are doctors of medicine and doctors of osteopathy who are so licensed by the states and territories.

Hospital. A hospital means "only an institution which is operated in accordance with the laws of the jurisdiction in which it is located pertaining to institutions identified as hospitals; is primarily engaged in providing diagnostic and therapeutic facilities for surgical and medical diagnosis, treatment, and care of injured and sick persons by or under the supervision of staff physicians or surgeons; and continously provides 24-hour nursing service by registered graduate nurses." Institutions which are primarily places of rest—those for the aged, nursing homes, convalescent homes, and those for treatment of alcoholism or drug addiction—are specifically excluded. Also, for the civilian part of the program, any facility operated by the Federal Government is excluded, except for emergencies. This excludes the Veterans Administration hospitals from general participation.

Inpatient Care. The civilian part of the program is essentially for inpatient care. The dependent is entitled to care in semiprivate accommodations—two, three, or four beds in a room. Care in a hospital is authorized for diagnosis, treatment of acute medical and surgical conditions, maternity and infant care, dental care that is a necessary adjunct to medical or surgical care (except that restorations are not authorized), acute emotional disturbances where necessary to protect the patient, and contagious diseases. Hospitalization in a civilian facility is authorized for 365 days if necessary, and all necessary services and supplies shall be provided for this period. Hospital care is not authorized to cover treatment of chronic diseases or nervous and mental disorders, elective medical and surgical treatment, domiciliary care, treatments or procedures ordinarily treated in outpatient facilities, or ambulance service.

Outpatient Care. In general, outpatient care is not authorized. Prenatal and postnatal care is authorized on an outpatient basis for maternity cases. Two visits for infant care as well as immunization during these two visits are authorized. X-ray therapy, if prescribed while the patient is in the hospital, may be continued on an outpatient basis after discharge from the hospital. In cases of bodily injury, the patient can be cared for as an outpatient at Government expense. Also for bodily injury or surgical operations, a certain amount of pre-admission diagnostic tests and services as well as a certain amount of such service following hospital discharge can be had at Government expense.

Costs to Patient. The patient must pay the first $25 of the hospital charge or $1.75 for each day in the hospital, whichever is the greater. If the physician prescribes a private room, the patient must pay 25 per cent of the difference between the private room charge and the weighted average of semiprivate room charge. If the patient elects to have a private room, she must pay all of the difference between private and semiprivate accommodations. If the physician prescribes private nursing service, the patient must pay the first $100 plus 25 per cent of the additional charges for such service. If the patient desires private nursing service, and this is not prescribed by the physician, she must pay all of the charges for this service. When a patient is treated for a bodily injury and not admitted to a hospital, she must pay the first $15 of the cost and any charges in excess of $75 for roentgenographic and laboratory examinations for this treatment. If maternity cases are cared for in the home or office, the patient must pay the first $15 of the charges. If laboratory and roentgenographic tests are accomplished before admission to a hospital for a surgical procedure under the direction of the attending physician, the patient must pay for all of such charges in excess of $75, unless additional charges can be fully justified by the attending physician. If tests and laboratory and x-ray procedures are prescribed after discharge from the hospital, the patient must pay all in excess of $50 of such charges, again unless the physician justifies additional charges. (This does not apply to deep x-ray therapy that is prescribed while the patient is in the hospital. Such therapy can be continued at Government expense after the patient leaves the hospital in accordance with the Schedule of Allowances.)

Costs to Government. Except for the charges specifically stated to be the responsibility of the patient, the Government will pay the cost. It is emphasized that the dependents' medical care program is a full service plan, and the physician or hospital may not charge the patient any fees other than those which have been specifically designated for the patient to pay.

The progress already achieved by the Office of the Executive Director in the implementation of the program can be summarized in a discussion of hospital and physician costs and the general operation of the program:

Hospital Costs. The American Hospital Association, by resolution of its House of Delegates, has recommended that hospitals in states assigned to Blue Cross bill in accordance with Blue Cross rates in effect at the time of submission of a statement. Nonmember hospitals may bill at their standard rates, but there is no reason why the Blue Cross cannot try to obtain discounts from these hospitals. Since the basic reason for this lower rate is prompt and complete payment, it would appear that hospitals might well allow discounts for the medical care program. The hospitals in those states in which care has been assigned to the insurance industry presumably will bill at their normal rates, but here again it is expected that some discount may be made for prompt and complete payment.

Physician Costs. Each state medical association was asked to submit a schedule of allowances to be used as a maximum for payment of physicians. The association was asked to name its own Fiscal Administrator. Many states named their own Blue Shield; others, insurance companies; some decided to handle their own fiscal business. As of 26 November 1956, contracts are in effect in 30 states and territories; 12 additional ones are complete with no differences known to us, but ratification by committee, house of delegates, or council in these states is pending. This has been accomplished since 24 October by individual negotiations between representatives of each state and and a team of Government negotiators. Two days were allowed for each state. Contracts in 10 states are not in effect for various reasons.

Operation of the Program. Reduced to its most simple terms, the operation of the program for hospital care will be somewhat as follows:

1. The patient goes to the physician of her choice, who sends her to the hospital, performs service, and directs discharge. The physician's bill is submitted on Statement of Services Provided by Civilian Medical Sources, DA Form 1863, to the local Blue Shield organization or other fiscal agent, who pays the physician directly and consolidates his bill with others; these are forwarded to the Executive Director's office once monthly. The Executive Director certifies the complete amount for payment to local Blue Shield.

2. The hospital collects the authorized amount from the patient and submits monthly consolidated vouchers of the balance on the same form to the Executive Director for reimbursement.

3. The physician and hospital programs are both administered by the contractor on a nonprofit basis. In other words, the administrative costs are those actually incurred by the Blue Cross, Blue Shield, medical society, or insurance company; and these costs are subject to audit by the Army.

4. The state medical associations are expected to use their grievance and review committees to render advice on questions that may arise as to charges or type of practice. Unusual conditions are reportable to the Executive Director from any source.

5. In those areas where either physician or hospital contracts are not in effect on 7 December, physicians and hospitals can accept patients under the program and forward their bills to the Army commanders for adjudication and payment.

Fraud. We are alert to the possibilities of fraudulent acts in this program. They may occur in three general areas. Ineligible persons may pose as dependents. Ineligible hospitals or physicians may submit charges and receive payment. Charges for procedures not accomplished may also be presented for payment. However, methods of identification have been devised. Auditing and inspection procedures will be accomplished. Those who have perpetrated fraud may be subject to prosecution by the Federal Government. Steps will be taken to recover money from individuals or agencies who have defrauded the Government.

Fee Schedules. As must be the case with all fee schedules, the one that was sent out does not meet many of the problems which arise. The schedule itself lists some 1,700 items. Approximately 200 common procedures were marked with an asterisk, and the state medical associations were urged to complete a schedule on the items so marked, if they were unable to accomplish a schedule on each item. No way could be devised to recognize in the schedule differences in fees for general practice versus specialty or rural versus urban situations. As a consequence, most of the fee schedules were designed to cover the maximum fees for the specialties. In the field of surgery, many of the procedures are accomplished only by those who have had long training within a specialty. Many procedures, however, are accomplished by general practitioners and doctors of osteopathy as well as by specialists. Specialists' rates for these procedures were, in most cases, quite high. Our office adopted a policy that the fee schedules in each state should represent the normal charges of physicians as a whole, for individuals of an income ranging from $4,500 to $5,000 per year. It had been estimated that more than 90 per cent of all of the dependents who seek care under this program will have an average yearly income of not more than $4,500. All possible information from Blue Shield and other payment plans were used by our negotiators to arrive at a figure for each of the 1,700 items in the schedule.

In many of the states, apprehensions were expressed concerning the general philosophy of the Dependents' Medical Care Act. Many persons sincerely fear expansion of this program into other fields. Many fear that the law itself, since it implies a full service coverage, has a tendency to obstruct free communications between the patient and the physician. Some states indicate that their high fee schedules were purposely designed to cover all of these contingencies. On the other hand, several states entered into the program in the spirit with which it was approached by Congress and submitted reasonable and acceptable rates, together with a full understanding of the contractual procedures that were necessary insofar as the Government was concerned.

Some of the states have developed elaborate plans for controlling, within their own borders, the amount which will be paid to each physician, and will require the physician to accept his normal charges as long as they are within the fee schedules. Many of the states, however, are of the opinion that each physician will charge the maximum rate in the schedule and will be entitled to payment of this amount.

The fee schedules were negotiated by physicians; six Army physicians and one Navy physician represented the Government in the negotiations. Each officer was assigned a state and negotiated privately with the representatives of that state. No attempt was made by the negotiator to establish any national fee schedule. Those matters that were peculiar were taken into consideration in the development of a fee for each item on the schedule.

We have tried to produce an equitable fee schedule with each state, and believe that the state representatives, as a whole, have been conscientious in their endeavors to arrive at fair and equitable schedules.

Blue Cross and Insurance Companies. There have been long discussions concerning the coverage of the hospital part of the program by Blue Cross and the insurance industry. It was considered by Congress that, in order that comparison of cost to the Government could be made, there should be competition between these two groups.

Contracts with national Blue Cross covering 31 states, the District of Columbia, and the Territories of Alaska, Puerto Rico, and Hawaii will be in effect on 7 December 1956. Contracts with Mutual Benefit and Health Association will cover 17 states, also going into effect on that date. (Blue Cross states are Washington, Oregon, California, Idaho, Nevada, Arizona, Utah, Montana, Wyoming, Colorado, New Mexico, Michigan, Ohio, Kentucky, Tennessee, Mississippi, Alabama, New York, Pennsylvania, West Virginia, North Carolina, Virginia, Maryland, Delaware,

Massachusetts, Vermont, New Hampshire, New Jersey, Connecticut, Rhode Island, Maine. Mutual Benefit and Health Association states are North Dakota, South Dakota, Nebraska, Kansas, Oklahoma, Texas, Minnesota, Iowa, Indiana, Missouri, Arkansas, Louisiana, Wisconsin, Illinois, Georgia, South Carolina, Florida.)

Doctors of Osteopathy. A real problem has been presented by the definition of a "physician," which as stated before includes doctors of osteopathy in some states. Medical associations of certain states have objected to furnishing information concerning this program to doctors of osteopathy within their states, because they consider that this encourages medical practice which in some instances may be substandard.

State laws vary considerably. Doctors of osteopathy in some states may, for example, be fully licensed to practice obstetrics but are not legally authorized to prescribe and administer all drugs and to perform all surgical procedures. In some states they fall within the definition of "physician" while in others they do not, being authorized to practice limited medicine only. Endeavors are being made through the state medical licensing agencies to determine who is legally entitled to payment under the law as implemented by the directive, and specifically under the definition of "physician."

Dental Care. Shortly before the joint directive was promulgated, a provision was included for dental care that is a necessary adjunct to medical or surgical treatment rendered to a dependent who is a hospital inpatient in the civilian part of the program. No representation similar to that with the American Medical Association and state medical associations had been accomplished with those representing the dental profession. It was recognized that this was a small program; nevertheless, it was important and some means were necessary to pay the dentists who might render service under the program in its early stage. As an interim measure pending discussion with the dental profession, it was decided to ask the Blue Shield organization, or whatever fiscal agency was serving the state, to accept bills from doctors of dentistry and forward them to the Executive Director's Office in Washington for adjudication and payment.

Veterans Administration schedules have been in effect for many years, and it was considered that these schedules should be used temporarily in adjudication of the charges received. This plan was submitted to the Secretary of the American Dental Association, who felt that the dental profession should be consulted. Arrangements are being made to have a meeting with representatives of the American Dental Association at an early date, in an endeavor to arrive at some better solution to this problem as quickly as possible.

General Implementation. We are now in the process of setting up the operational features of the program. Cost and statistical analyses, and procedures and methods are being devised that will accumulate information for determining the accomplishments of the program and preparing necessary reports. A liaison group composed of a representative of each of the Surgeons General has been established. These representatives will advise the Executive Director of any changes which should be made in the program to assure that it effectively meets the needs of all the uniformed services.

It is our conviction that this is a most important program insofar as morale within the uniformed services is concerned. Every effort will be made to administer it in a manner which will be mutually acceptable to all concerned.

UNWARRANTED FANCY OR TOMORROW'S EPIDEMIOLOGY?

There is at present no conclusive laboratory evidence that if large enough populations are screened some degree of resistance to any single chemotherapeutic agent cannot be shown for any given *species.* Fortunately, however, at the present time only a few of the potentially resistant pathogenic organisms present clinical problems. It is certainly not a great extrapolation from available evidence to imagine a transfer of resistance, in nature, from a resistant carrier strain of low pathogenicity to the more highly pathogenic but apparently less mutable stock which was observed in the laboratory. Further investigation alone will reveal whether this is unwarranted fancy, or the basis for tomorrow's epidemiology.

—HENRY P. TREFFERS
in *New Zealand Medical Journal*
p. 568, Dec. 1954

THE FUNCTIONS OF THE NAVAL NEUROPSYCHIATRIC TREATMENT CENTER

JOHN F. McMULLIN, *Captain, MC, USN*

THE ACTUAL establishment and operation of definitive treatment centers for neuropsychiatric patients in the Navy and Marine Corps is of rather recent origin. In fact, the present two treatment centers have been in operation only some seven years. While not a long time, it certainly is of sufficient length for us to assess their worth, measure their accomplishments, perceive their shortcomings, and plan for their improvement.

BACKGROUND

Prior to 1948, adequate provision for the care of psychotic patients had been made in institutions outside the Navy. From World War I until 1948 the facilities of St. Elizabeths Hospital in Washington, D. C., were traditionally available for our psychotic patients, and from 1942 to 1949 additional facilities for the treatment of psychotic patients were made available at the Public Health Service Hospital at Fort Worth, Tex. Excellent as these facilities were, the expanding role of Navy medicine dictated the need for the establishment of a Navy Neuropsychiatric Treatment Center.

The first such center was planned as an integral part of the U. S. Naval Hospital at Houston, Tex. Hardly had the plans for this been completed when in December 1948, without prior notice, the new U. S. Naval Hospital at Houston was summarily transferred to the Veterans Administration by Executive Order. Coincidentally, at the same time pressure was being brought to bear to have the Navy provide its own facilities for the considerable number of patients which had accumulated both at St. Elizabeths and at Fort Worth, the Bureau of the Budget having denied the Navy the further use of St. Elizabeths Hospital. The immediate problem was great; but, because plans had long since been formulated for the inauguration of neuropsychiatric treatment centers, these were immediately implemented, with the result that not many months later the first of the centers opened at this hospital, and a short while later the west coast center began opera-

From U. S. Naval Hospital, Philadelphia, Pa.

tion at the U. S. Naval Hospital at Mare Island. Since April 1950, the west coast center has been at the U. S. Naval Hospital, Oakland, Calif. Thus only within the past seven years has there been available within the Navy adequate facilities for the definitive treatment of all types of psychiatric disorders.

It seems fitting to pause at this point to say a word about the happy relationship between the Navy and St. Elizabeths Hospital. That large Federal mental hospital of some 7,000 beds, supported directly by money from the Congress, has been in many ways the model of a state hospital, in which capacity it serves for the District of Columbia. In 1909 the Surgeon General of the Navy accepted an invitation from the Superintendent of St. Elizabeths Hospital to assign naval medical officers to that institution for training in psychiatry. This was the initial step toward a recognition of the need for naval medical officers to have postgraduate training in psychiatry. In the ensuing years, more and more naval medical officers served on the house staff at St. Elizabeths and benefited greatly from the guidance of such men as William Alanson White, Kempf, and in more recent years, Winfred Overholser. Many of us who were witnesses to the excellent care our Navy patients received at St. Elizabeths up through 1948 saw the passing of this phase of Navy psychiatry with much regret.

In order to better orient ourselves with regard to the strategic goals envisioned for our neuropsychiatric treatment centers, it will be helpful to go back some years and quote from an address given in 1949 by the then Chief of the Neuropsychiatric Branch of the Bureau of Medicine and Surgery:

> The program (for these centers) was to lay emphasis on treatment, training, and research in all categories of neuropsychiatric conditions. It is the Surgeon General's wish that the emphasis would not be considered to be on the psychotic, with all the negative connotations associated with those conditions (as in other chronic conditions, such as chronic tuberculosis), but in providing an outstanding center for the definitive study and treatment of psychiatric cases which require early intensive inpatient procedures. The plan is to provide the center with all of the physical and personnel resources to do an outstanding clinical job. This would include an expanded staff of psychiatrists, clinical psychologists, and social workers, in addition to an ample number of trained nurses and other ancillary technician personnel.
>
> In transferring this program from Houston to the naval hospitals at Philadelphia and Mare Island, it was intended that all of the advantages of the "center" concept would also be transferred, with the ultimate aim of concentrating all inpatient psychiatry at Mare Island and Philadelphia, so that psychiatrists assigned to other naval hospitals would then be able to devote an increasing amount

of their time to outpatient consultations and treatment with greater emphasis on the preventive aspects of psychiatry. In the actual operation of this plan psychiatrists stationed at other hospitals on the east and west coasts will determine the needs of their psychiatric patients and if, in their judgment, these patients require consideration or treatment other than that which can be given as an outpatient under each psychiatrist's care, the facilities at the two centers would be available for this purpose. It is visualized that these centers will have available excellent clinicians and every possible resource for providing the very best of modern medicine, surgery, and psychiatry.[1]

PRESENT STATUS

The basic plans for each neuropsychiatric treatment center called for a 250-bed unit functioning as an integral part of the general hospital, but with a certain degree of autonomy. Within a short time, additions had to be made to increase the capacity to about 400 beds. I have had the privilege and the experience of having been Chief of Service at both the east and west coast centers, and have been in the rather unique position of attempting to standardize methods of operation and policies in both these institutions. Having spent the past six years in this capacity, I have come to certain conclusions as to the role or function of these centers. But first, I should like to describe what we are presently doing—*i. e.*, our present functions.

The primary responsibility of a psychiatric hospital is to give good treatment and adequate care to its patients. This is being done at our centers in a manner that would be the envy of many of the nation's leading clinics. The fine facilities for the definitive treatment of neuropsychiatric disorders available today for the men and women of the Navy are in sharp contrast to the lack of such facilities even 10 years ago. We seem to have passed the stage of indifference and callousness that in earlier years dictated a policy of rapid disposition when prompt return to duty was not possible. An attitude of hope and helpfulness—a positive therapeutic attitude—is the by-product of this change from an emphasis on disposition of cases to an emphasis on what can be done to help the patient.

Decisions as to fitness for duty are properly relegated to a secondary role, since such decisions are best made only after we have made every reasonable effort to restore the patient to his former state of health. Every military physician has the usual physician's responsibility to his patient, as well as a responsibility to his command, *i. e.*, to the Navy. It may sound like a paradox, but it has been my experience that the latter responsibility, acquired at a later date when the physician dons a uniform, is taken at times somewhat too heavily, to the detriment of the primary responsibility of physician to patient. In our centers,

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all the usual forms of psychiatric therapy are available, including electroconvulsive therapy (ECT), insulin coma therapy (ICT), and both specific and nonspecific psychotherapy.

The Training of Psychiatrists. This is a most important function of our centers, and in this regard our east coast center has established an enviable record in providing both long and short courses of instruction in psychiatry for medical officers. This is a continuing operation that had its inception in World War II, when, under the direction of Dr. Edward A. Strecker, groups of properly selected medical officers were given a three-months' course in basic neuropsychiatry of sufficient intensity to enable them to handle thereafter many of the routine neuropsychiatric problems encountered in the service. It is a singular fact that a high proportion (55 per cent) of those medical officers continued on in the specialty. Of those who did continue, 89 per cent went on to complete their training requirements in subsequent years, and of that group over 35 per cent have gone on to Board certification.[2] The last such group convened in the summer of 1952 and, following completion of the four-months' course, most have continued on for a two-year period as residents in our several hospitals and have gained the experience and maturity that should enable them to be good clinical psychiatrists. At the present time, both our centers provide an approved residency training program for two years in psychiatry, and for one year in neurology.

Professional Growth. In the training of residents per se, the emphasis is heavily on the practical aspects of clinical psychiatry, with a view toward achieving the maturity that is best gained by the assumption of responsibility for the patient's care. About maturity, we see so much striving for it as an end in itself. Just as no one should set out to be happy, so no one should strive to become, per se, a mature adult. Full maturity usually comes as a kind of bonus to experience and to the performance of one's duties in his career and home.[3] An earnest effort is made to overcome present-day tendencies of so overloading psychiatric residents with didactic teaching that their opportunities for the direct study of patients are limited.

The attitudes the resident forms during this critical period of his professional growth are as important as the knowledge and skills required of him. It is important that the resident recultivate some of his former interests in logic and philosophy, so that he may maintain critical attitudes toward the nature of evidence, its evaluation, what constitutes knowledge, how it is obtained, and what is the difference between an observed fact and an inference. Our residents show a timidity and reluctance to buck current trends and be bold in their thinking. This is related to their fear of ostracism and nonconformity.[4] Our psychoanalytic

institutes are teaching mostly craftsmanship and are not creating an intellectual climate where freedom of thought or the right to dissent too widely is encouraged.[5]

Administrative Experience. The residency training program in our Navy neuropsychiatric treatment centers is also putting proper emphasis on the role of medical administration in psychiatric hospital treatment. Certain physicians, new to the practice of hospital psychiatry, are frequently unaware of the necessity and the value of medical administration as part of the medical services. There is a real danger that they may become so obsessed with the individual doctor-patient relationship that they may conjure up all sorts of rationalizations to avoid making administrative decisions regarding their own patients. Such may, for instance, result in that unwieldy, unrealistic situation whereby the patient must have two doctors—one a "therapist," the other an "administrator" to control his privileges, et cetera. Likewise, the doctor's failure to appreciate the broader therapeutic role of the hospital often results in a tendency to overuse the purely medical facilities for treatment (like FCT, ICT, et cetera) and to neglect to use all the other resources of the hospital for rehabilitation. In such instances, we often see a failure to use the particular skills of the recreation worker, the social worker, and the occupational therapist, or a blindness to the tremendous opportunities our nurses have to use the technics of group therapy in their daily contacts with their patients.

A most significant function of our neuropsychiatric centers has been the training of psychiatric aides, or, as they are termed in Navy parlance, neuropsychiatric technicians. To this end, each of the centers conducts a four-months' training course, both didactic and practical, in psychiatric nursing and related subjects. The graduates of these schools have made a most significant contribution toward the betterment of patient care in our centers. Both centers have conducted these training courses in the belief that it is the corpsmen who, spending eight hours or more with the patients each day, can influence, either favorably or unfavorably, the patient's prospects for recovery, rehabilitation, and discharge from the hospital. We have just graduated our 39th class of technicians at this hospital.

ANALYSIS OF CASE MATERIAL

To more clearly demonstrate the functions of the center in regard to patient care, it would be helpful to analyze the types of patients seen at the center. For this purpose, we have recently completed a study of 200 cases selected at random from a total of 1,691 psychiatric inpatients discharged from this hospital during the year. The general purpose of this study was to attempt to describe the kinds of psychiatric patients which pass through this

service. Only the highlights of this study will be commented on here, since space precludes giving the results in detail, and it is planned to publish these later in a separate article. We were, however, interested in certain data so that we might be in a position to measure some of the results of our treatment program.

In evaluating the results of this study two factors, both of which tend to operate against each other, must be kept in mind. First, it must be remembered that service personnel are a selected population, in that all had to meet certain minimum physical, educational, and mental standards to enter the armed services. In this sense, one might safely postulate that service personnel are, by and large, healthier and better educated than a random sample of the civilian population. Carrying this a step further, it can also be assumed, for these reasons, that psychiatrically ill service personnel are, on the whole, healthier and better educated than a random sample of patients admitted to civilian state hospitals. An argument could be made that this population would suffer different kinds of mental disorders and differ from the civilian population in other vital respects. Accordingly, perhaps one should be cautious about comparing the results of this study to the populace at large.

Secondly, this hospital is the treatment center for the east coast and, as such, the great majority of the patients received here are the more serious cases which could not be disposed of at other medical facilities (*e. g.,* ship, dispensary, local naval hospitals). In other words, by the time a patient gets to this hospital, he is, in most cases, at the last stop of the treatment sequence; and, following discharge from this hospital, is either ready for discharge from the service or return to duty. The previous two factors do not necessarily cancel each other out; however, they should be considered in evaluating the following results.

Age

The average age of patients admitted was found to be 23 years, with a range between 18 and 48. (It is believed that this population is, on the whole, younger than the patients admitted to civilian state hospitals.)

Sex

Ninety-three per cent of the patients admitted were male, and seven per cent were female. (It is to be expected that in view of the marked preponderance of males in the service, a proportionate number of males would be admitted here. Bureau of Naval Personnel statistics report that the proportion of males to females in the entire Navy and Marine Corps is 98.6 to 1.4 per cent.)

Education

The average (mean) number of years of education completed was 10.7 years, although the most frequently occurring (mode) level which was reached was 12 years, or high school graduation. The 1950 census reports that the average number of years of education for the population of the United States in that year was 9.3 years. Thus, the military patient population appears better educated, on the average, than the general civilian population.

Rank

Seven per cent were officers, 25 per cent were rated enlisted personnel, and 68 per cent were nonrated enlisted personnel. (Statistics obtained from the Bureau of Naval Personnel show the following distribution as of May 1954, throughout the Navy and Marine Corps: 10 per cent officers, and 90 per cent enlisted personnel. A statistically significant difference was found in these figures which indicates that officers are less likely to have psychiatric breakdowns than enlisted men. This seems a logical finding, in that officers must undergo a much more rigid selection process.)

Branch of Service

Seventy-four per cent of the patients were in the Navy, 21 per cent in the Marine Corps, and 5 per cent in the Air Force. (The Bureau of Naval Personnel statistics show the following distribution for the entire naval service: 77 per cent in the Navy, and 23 per cent in the Marine Corps. No statistically significant difference was found in this study which would indicate that either Navy or Marine personnel are psychiatrically hospitalized in greater proportion than would be expected from their numerical ratio in the service.)

Length of Service

The average length of service of patients admitted to the neuropsychiatric service was 25 months. Twelve per cent of the patients admitted had less than 6 months' service, 22 per cent had less than 1 year's service, and 48 per cent had less than 2 years' service; 94 per cent of all patients (practically all) had less than 3 years' service. This tends to bear out the contention that psychiatric breakdown in the Navy occurs rarely in personnel with more than 3 years' service.

Family Constellation

Forty-nine per cent of our patient population had parents living together at the time of their admission to the sick list. Accordingly, more than half of all the patients (51 per cent) came from homes which were broken for one reason or another. Statistics on the national average of broken homes are not available, but it is reasonable to assume that these patient figures are higher. Whether broken homes are a causative factor in mental illness cannot be

answered by this data. It appears to be symptomatic of all forms of social disorganization (*e. g.*, delinquency and crime, as well as mental illness). It is interesting to note that of the 49 per cent who had parents living together, there was a note in 18 per cent of these records of considerable parental dissension.

Disciplinary Record

Of the patients admitted to this hospital, 26.5 per cent had disciplinary charges in their record (*i. e.*, they were mentioned in the case history and were either in the past or were pending).

Source of Admission

Of the patients, 72.5 per cent were transferred from another hospital, the greatest source of our admissions.

Disposition

Thirty-nine per cent of the patients were discharged to their homes; 32 per cent were discharged to a Veterans Administration hospital; 14 per cent were sent back to duty (12 per cent to full duty and 2 per cent to limited duty); 4.5 per cent were sent back to duty for completion of disciplinary action; and 7.5 per cent were returned to the marine barracks. (Of this last group, 3.5 per cent were returned for discharge, 3.0 per cent for orders and earned leave, 0.5 per cent to await return to duty, and 0.5 per cent for limited duty with discharge recommended.) Though discharge from the service was indicated and effected in 77.5 per cent of all neuropsychiatric patients, it is significant that 68 per cent of all patients discharged were well enough to leave the hospital after an average stay of only some 61 days. This speaks well of the efficacy of early treatment for psychiatric disorders.

Incoming Diagnoses

The following categories included patients whose diagnoses were established and also patients whose diagnoses were undetermined (DU): 59 per cent of all cases admitted came in with a diagnosis of psychosis (55 per cent of all cases were schizophrenics); 16.5 per cent of all patients were admitted with a diagnosis of psychoneurosis; 9 per cent of all patients were admitted with character and behavior disorders; and 15 per cent of all patients were admitted with other than psychiatric diagnoses.

Length of Hospitalization

The average length of hospitalization for all patients on this service was 61 days. Patients on the average spent 17 days at another installation immediately prior to admission here. Consequently, the total length of hospitalization for the average patient is 84 days.

Final Diagnoses

Psychosis—46 per cent of all patients discharged from this hospital had diagnoses of psychosis. As to be expected, the schizophrenics totaled 43.5 per cent.

Psychoneurosis—13.5 per cent of all patients were discharged with diagnoses of psychoneurosis.

Character and behavior disorders—36.5 per cent of all patients were discharged with diagnoses of character and behavior disorders. (On admission, only 9 per cent of patients were diagnosed as having character and behavior disorders, which leads us to the conclusion that, as common as these are, they are not as readily recognized and are frequently misdiagnosed as either psychosis or neurosis by many medical officers.)

Treatment

The treatment given patients on this service could only be grouped in rough fashion. For example, psychotherapy could include not only systematic and intensive psychotherapeutic interviews on a regular basis but more casual contacts as well. Because of the ambiguity of the term and the lack of systematic information in the records, there is no breakdown of this category. This should not be interpreted to mean that psychotherapy was not practiced; on the contrary, there was evidence to indicate that it was used rather extensively. In the following categories, the treatment the patient received both prior to admission to this service and while on this service is noted: 15.5 per cent of the patient population received electro-shock treatment (2.5 per cent prior to admission, 13 per cent after admission); 6 per cent received insulin treatment (less than 1 per cent prior to admission, 5.5 per cent after admission); and 80 per cent received nonspecific treatment.

A rather striking phenomenon observed in our hospitals during these past several years (1951 through 1954) has been the rarity of combat neuroses and the infrequency of any type of psychiatric disorder that could be correlated with combat situations. Those of us who saw hundreds of such cases in World War II now are hard pressed to find even one or two cases for teaching purposes.

THE FUTURE ROLE OF THE CENTERS

The desirability and feasibility of providing definitive psychiatric care for our Navy and Marine Corps patients in the setting of a military hospital has been amply proved and established by the success attendant upon our efforts in both the east and west coast treatment centers during these past seven years. It seems unlikely and inconceivable that the Navy Medical Department will ever take a backward step and delegate this important phase of treatment to a nonmilitary agency or to Federal or State hospitals. The prognosis in psychiatric disorders not only de-

pends on the availability of adequate treatment facilities, but is greatly influenced by the familiarity of the setting in which treatment is undertaken.

Our military patients have a right to the best treatment available, and it has always seemed important to me that it be undertaken so far as is possible in our own military hospitals. For the Navy psychotic patient, for example, to find himself precipitously transferred to a Veterans hospital or a Federal mental hospital brings with it many undesirable connotations and removes a great many of the emotional supports that come from being taken care of by members of his own service family. A parallel example (and one which we should not emulate) is found in those civilian communities that fail to provide adequate psychiatric care for the population. Ideally, our larger urban communities (cities or counties) should provide a much larger share of good treatment and not depend so heavily on the state hospitals. Similarly, since the Navy can be looked upon as a community in that its personnel have so many common purposes and characteristics, it is the Navy which must itself provide the best of treatment for its personnel at the earliest possible moment in the patient's disorder. As this is achieved, we find that a decreasing proportion of our patients require transfer to Veterans Administration hospitals near their homes for continued treatment.

Given somewhat more stability of personnel, our centers are capable of expanding their roles in teaching and training. At the U. S. Naval Hospital at Oakland, for example, graduate students in psychology and social work from nearby colleges and universities have secured valuable field placements. This is not only a recognition of the diversity of the case material available but also a tribute to the outstanding program of care given our patients. Likewise, it would appear feasible to make the facilities of our centers available for the affiliation in psychiatry for students of adjacent nurses' training schools. Serious consideration has recently been given to this phase of expanding the Navy's contribution to the betterment of psychiatric care. At the present time, the facilities of this hospital are used by the University of Pennsylvania in the placement of nurses undergoing graduate training in psychiatric nursing.

Research is as yet an area largely untouched by our centers. Much can and should be done. In this regard, we have an enviable source of follow-ups on those patients who are retired, since they are examined at 18-month intervals under current laws.

UNSOLVED PROBLEMS

One of the unsolved problems is that of providing proper care for those men and women in the service who require only outpatient treatment for psychoneurotic reactions and minor mal-

adjustments. We have seen repeatedly that inpatient care of such patients is as undesirable in military life as it is in civilian life. Too many such cases are being hospitalized, and we are faced with a dilemma in this regard. A possible solution may be the expansion of outpatient facilities at strategic locations such as receiving stations and naval shipyards, but as always, the demand for such facilities always seems to exceed the supply.

It has likewise been amply demonstrated that patients with character and behavior disorders do not for the most part belong in hospitals, but as a result of tradition in the Navy such patients are sent into our hospital neuropsychiatric services for study, evaluation, and disposition. I say study and evaluation, because we have come to learn that many patients with mild or moderate disorders of this type can and, for the most part, should be returned to duty, and as promptly as possible. Most patients of this type will gladly exhibit in the hospital most of their undesirable personality traits, to the point where the medical officer will be too willing to predict that the man could not perform effective duty. Such predictions may only reflect some of his own impatience and hostility, since we have learned in psychiatry during World War II that we should not be too ready to make bad prognoses regarding the abilities of borderline personnel to do effective military duty.

Nonetheless, until such time as we have extramural psychiatric clinics where personnel can be studied and evaluated, we shall probably have to keep to the present system of hospitalization, which results in discharge of a large percentage by medical survey. I am sure that laxity and loose standards in recommending men for discharge in this manner serves only to increase the number of candidates. On the other hand, if we can be more firm in our adherence to standards regarding discharge, if we maintain an attitude of expectation of better military performance, if we can make definite decisions regarding return to duty promptly, we can prevent a great deal of manpower wastage. Just as the man evacuated from combat back to the Zone of the Interior rarely if ever is salvaged for combat, so also the neurotic or psychopath retained in the hospital past a certain critical short period rarely if ever is salvaged for any kind of military duty.

It has been my purpose to outline briefly the present functioning of our two Navy Neuropsychiatric Treatment Centers and to comment briefly on possibilities for the future. I might better term this article a progress report rather than a terminal report, since we continually need to redefine our goals and to modify them in terms of our estimate of the situation and our shifting strategic goals.

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"Instead of reasoning that a patient develops a peptic ulcer *because* of emotional tensions, we need to understand that the given patient represents a dynamic aggregate, that he is affected by forces which alter his dynamic configuration, and that we witness such alterations in the totality of his being and in all of its relations. Similarly, instead of conceiving the sick person as having regressed to a lower personality level *because* of his illness, we need, rather, to understand that the interplay of forces which 'makes' the patient sick, also, and at the same time, though possibly in different manifest degrees, effects that alteration in personality which we label regressive."

—IAGO GALDSTON, M. D.
in *Archives of Neurology and Psychiatry*
p. 447, Oct. 1955

ENTOMOLOGIC ILLUSTRATION

At the 406th Medical General Laboratory

HUGH L. KEEGAN, *Major, MSC, USA*

ALTHOUGH personnel of the Medical Services of the armed services are encouraged to write articles for publication in professional journals, illustration of such articles is often a problem. Most scientists are not skilled artists, and those fortunate individuals who do possess artistic ability can rarely spare the painstaking hours of labor necessary for production of drawings acceptable for publication. A partial answer to this problem for entomologists of the armed services is provided by the taxonomic section of the entomology department of this laboratory. Eight Japanese artists assigned to the section perform a unique service in preparing drawings of medically important arthropods for publication in professional journals or in Army manuals.

This service had its beginning in 1946, when seven artists were employed by the 207th Malaria Survey Detachment to prepare illustrations of mosquitoes of Japan and Korea. The services of these artists passed to the Malaria Survey Section, 35th Station Hospital, in 1950, and to this laboratory in 1951. Projects for which illustrations have been prepared have been directed by both military and civilian entomologists. Among the latter have been prominent Japanese scientists, staff members of the United States National Museum (Smithsonian Institution), and entomologists under contract with the Office of the Surgeon General, Department of the Army.

Since completion of the earlier projects on mosquitoes of Japan and Korea, artists of this group have illustrated monographs on such subjects as mosquitoes of North America and Guam; parasitic mites found on small mammals in Japan and Korea; trombiculid mites of Japan and Southeast Asia; fleas and black flies of Japan and Korea; Nearctic black flies; Culicoides of Japan, Korea, Okinawa, and Panama; and ixodid ticks of Japan, Korea, and the Ryukyu Islands (figs. 1-4).

From 406th Medical General Laboratory, APO 343, San Francisco, Calif.

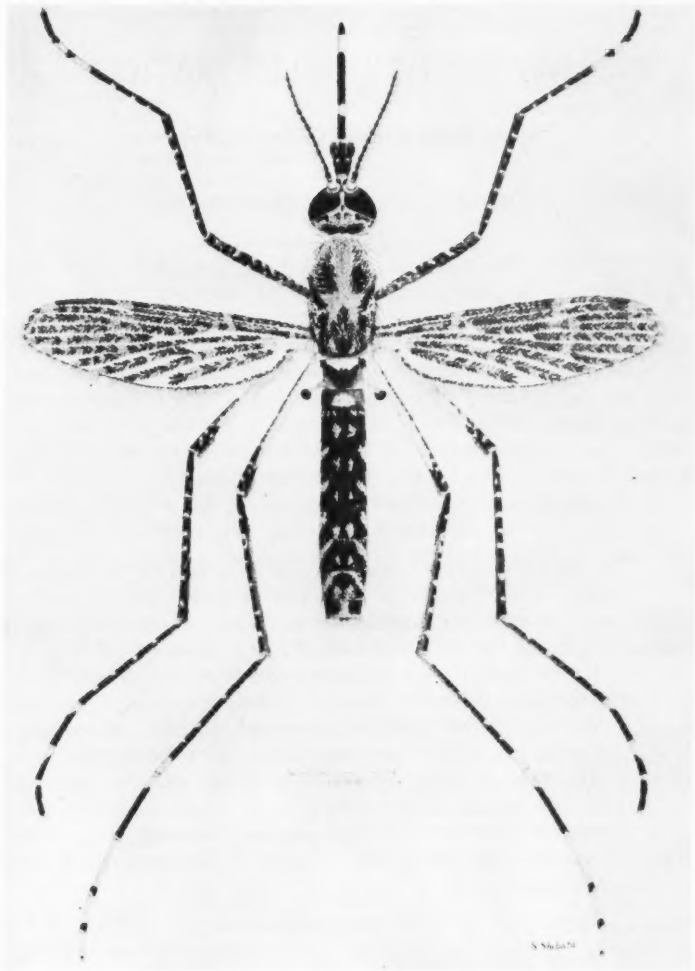

Figure 1. A mosquito of the genus Aedomyia.

Prerequisites for employment as an artist in this section have been a degree from a recognized Japanese art school or college, plus demonstrated ability. Each newly employed artist is given on-the-job training for about two months in use of microscopes and the camera lucida, drawing technics required in scientific illustration, methods of handling specimens, and structure of medically important arthropods. Four of the original seven artists

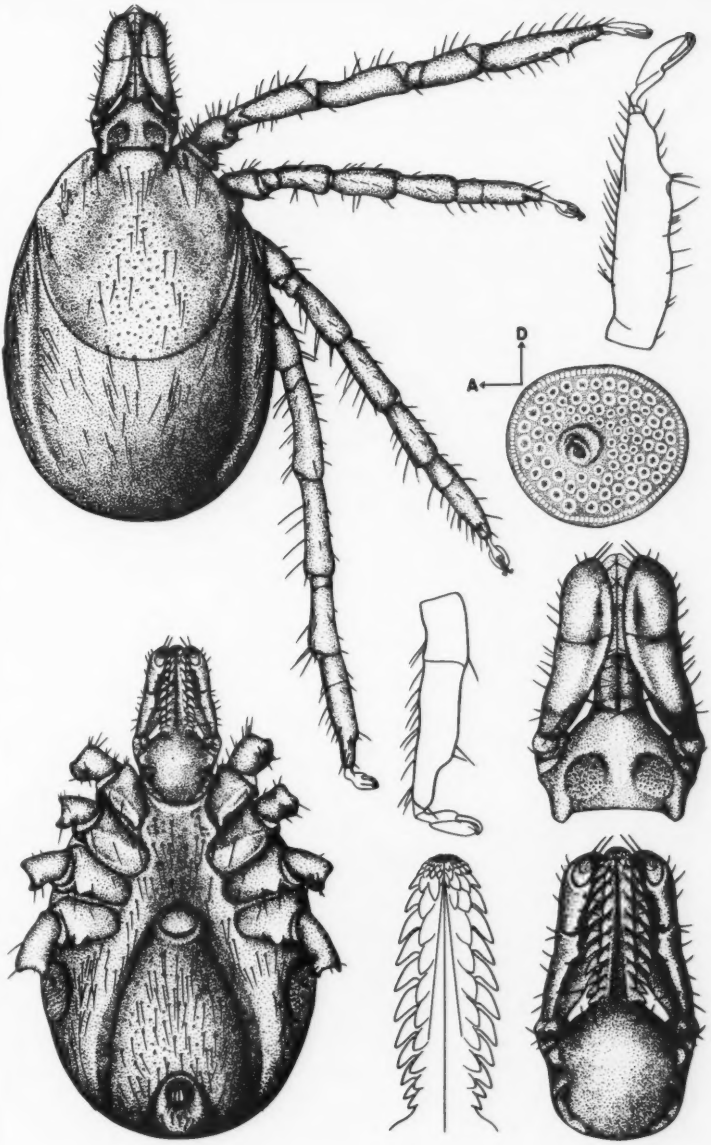

Figure 2. A female tick of the genus Ixodes. *The letters* A *and* D *refer to the position of the spiracular plate:* (A) *anterior;* (D) *dorsal.*

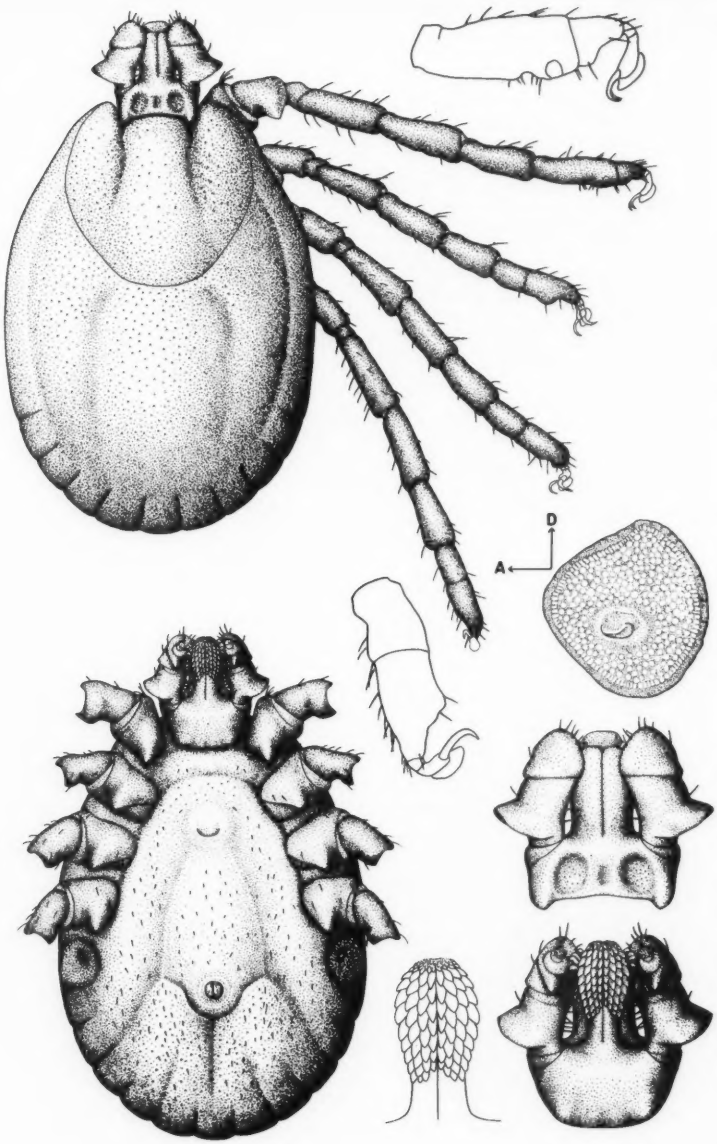

Figure 3. A female tick of the genus Haemaphysalis. *The letters* A *and* D *refer to the position of the spiracular plate:* (A) *anterior;* (D) *dorsal.*

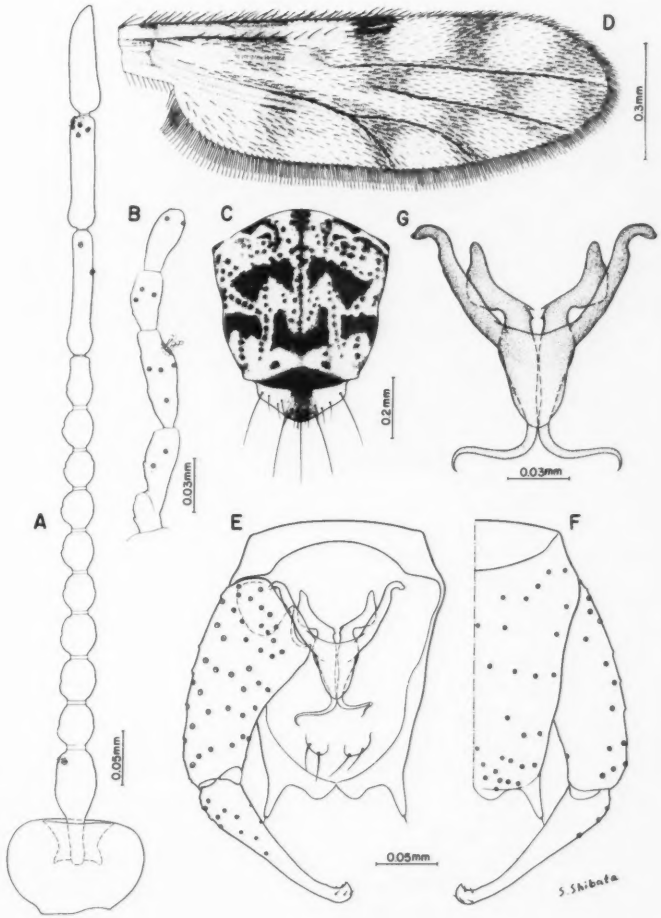

Figure 4. Taxonomically important structures of a blood-sucking fly of the genus Culicoides. (A) *antenna;* (B) *palpus;* (C) *dorsal view of thorax;* (D) *wing;* (E) *ventral view of genitalia;* (F) *half of dorsal view of genitalia;* (G) *aedeagus and parameres, ventral view.*

are still with the section and are now classified as advisors. In figure 5 four of the artists are shown working at desks which they designed.

Figure 5. Artists working at desks which they designed.

Specimens to be illustrated often must be dissected or mounted. Choice of the proper technic is essential if taxonomically important structures are to be clearly shown. Because only a few specimens of many species are available, there is little margin for error or faulty judgment in this work. Material for projects on arthropods from Japan, Korea, and the Ryukyu Islands is usually obtained from preventive medicine units, or is collected by an advisor or entomologist assigned to this section. These men also review the Japanese literature and maintain liaison with Japanese medical entomologists.

Illustrations for projects concerning arthropods of areas other than the Far East are accepted upon recommendation of higher authority, and approval of the Commanding Officer of the laboratory. In the absence of directed priorities, such projects are accepted on a first-come-first-served basis. Present commitments will keep the artists occupied until at least September 1958. Speed of accomplishment is not an objective here. The unhurried attention to detail, which results in clear and accurate portrayal, is the best assurance that illustrations produced by members of this section will continue to be of high professional caliber.

Sickle Cell–Hemoglobin C Disease

With Splenic Infarction Following High Altitude Ascent

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ANALYSES of human hemoglobin by electrophoretic technics has led to the elucidation of several new clinical syndromes. The initial discovery by Pauling and associates[1] that sickle-cell hemoglobin (Hb S) is electrophoretically distinct from the normal adult pigment (Hb A) was followed rapidly by the discovery of other abnormal hemoglobins. In 1950, Itano and Neel[2] reported the discovery of hemoglobin C (Hb C), and since then numerous reports[3–11] on patients with mixed heterozygous combinations of sickle-cell and type C hemoglobins have appeared. Chernoff,[12] in projecting the incidence of this syndrome in his clinic to the national population, estimated that approximately 10,000 persons in this country have sickle cell-hemoglobin C disease. Prior to the discovery of Hb C, many of these patients were considered to have sickle-cell trait or mild and atypical sickle-cell anemia.

An additional case of this syndrome is the subject of this report.

CASE REPORT

A 29-year-old Negro WAF was first seen on the medical service on 4 May 1954. The patient was admitted with complaints of left abdominal and flank pain which was aggravated by coughing, sneezing, and walking. She also had nausea, vomiting, leg pains, and fever. These symptoms had their onset a few hours after a commercial airline flight from Kansas City to Albuquerque, N. Mex.

Past History. The patient gave a history of previous similar attacks occurring from 10 to 16 years of age. Three of these attacks were severe enough to cause her to be bedridden. Numerous milder attacks occurred. The leg pains were prominent symptoms in the previous episodes and led to the diagnoses of "rheumatism" and rheumatic fever. For the next 10 years the patient felt remarkably well. She engaged in strenuous

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athletic activity, enlisted in the WAF, and completed basic training. In 1952 she was transferred to Albuquerque, and frequent attacks of left abdominal and flank pain again occurred. When hematuria complicated one of these episodes she was examined at a general hospital where the consultant urologist was unable to demonstrate organic genitourinary disease. However, noting sickling on a blood smear, he suggested that the hematuria could have been a result of sickle-cell disease.

Family History. The patient's mother died of cancer; her father is living. One male sibling died at age 14 from hemorrhage following an appendectomy and another brother died at age 7 of a "heart attack." The patient recalled that as a child she and other members of her family were repeatedly examined for the presence of sickle-cell disease but she was unaware that a definite diagnosis ever had been made.

Physical Examination. Examination revealed an acutely ill young Negro woman, moderately dehydrated, with a temperature of 100°F. There was tenderness to palpation over the left upper abdominal quadrant; the spleen was palpable, firm, and moderately tender. Slight ankle edema was noted and there was marked tenderness to palpation over the anterior surface of both tibias. The remainder of the physical examination was normal.

Laboratory Findings. Hematologic findings on admission are summarized in table 1. Urinalysis and liver function tests were normal. Roentgenograms of the chest, skull, tibias, and fibulas were normal. Electrocardiographic findings were within normal limits. Paper electrophoretic study of the patient's hemoglobin revealed mobilities which corresponded to those of S and C hemoglobins, present in approximately equal amounts.

TABLE 1. *Hematologic data on admission*

Red blood cell count	3,550,000 per μl
White blood cell count	14,400 per μl
Hemoglobin	9.5 gram per 100 ml
Reticulocytes	2.2%
Sickling of red blood cells	present
Target cells	numerous
Platelet count	46,000
Sedimentation rate	4 mm/hr
Osmotic fragility	0.33 to 0.15%
Serum bilirubin, total	2.8 mg per 100 ml
Bone marrow	erythroid hyperplasia

Subsequent Course. On symptomatic therapy the patient improved. The anemia and thrombocytopenia which were present on admission gradually disappeared. She was then sent on temporary duty to an installation in New York state where she was in excellent health. In August 1954, the

patient returned by train to New Mexico. She traveled for two days with no difficulty, but on reaching the higher altitude of Colorado she developed nausea, vomiting, and left upper quadrant pain. The symptoms progressed in severity and led to her hospitalization when she arrived in Albuquerque. Findings were similar to her first hospitalization. Again the patient gradually improved and she was discharged in November 1954, with a recommendation that she be stationed at a low altitude. This was done and follow-up five months later revealed the patient to be entirely asymptomatic.

DISCUSSION

According to the concept originally proposed by Neel,[13] sickle cell-Hb C disease is a heterozygous disease with one parent contributing the gene for sickling and the other contributing the Hb C gene. Sickle-cell anemia is the homozygous condition in which a gene for sickling is inherited from each parent. Table 2 summarizes some important differences among the three common sickle-cell abnormalities: sickle-cell trait, sickle-cell anemia, and sickle cell-Hb C disease.

TABLE 2. *Comparison of the three common sickle-cell abnormalities*

	Sickle-cell trait	Sickle cell-Hb C disease	Sickle-cell anemia
Hemoglobin pattern	A + S	S + C	S + F
Incidence (American Negroes)	1:12	1:5,000	1:600
Sickling	present	present	present
Target cells	0–5%	20–85%	5–30%
Anemia	–	– to ++	+++
Crises	–	– to ++	+++
Splenomegaly	–	+	– (adults)
Osmotic fragility	normal	decreased	decreased

Widespread use of electrophoretic technics has led to the discovery of other abnormal hemoglobins. These have been designated as hemoglobins D, E, G, H, and I. Fetal hemoglobin (Hb F), which is not under the genetic control of the same set of allelic genes that determines Hb A, may persist into adulthood in patients with thalassemia, sickle-cell anemia, and other hemolytic anemias.

Sickle cell-Hb D disease[14] and sickle cell-Hb G disease[15] have also been reported, but evidently are rare conditions. Combination of sickle-cell hemoglobin with the remaining abnormal hemoglobins is theoretically possible but has not as yet been reported.

Hb C may exist alone (homozygous Hb C disease) or in combination with normal hemoglobin (Hb C trait). Sickling of erythrocytes is absent but target cell formation is a prominent feature of these conditions.

A definite diagnosis of sickle cell-Hb C disease is possible only by electrophoretic analysis of the patient's hemoglobin. However, clinical suspicion should be aroused by the observation of a Negro patient who exhibits symptoms suggestive of "atypical" sickle-cell anemia with splenomegaly, sickling, and numerous target cells in the peripheral blood smear.

Although the clinical course of sickle cell-Hb C disease is usually milder than that of sickle cell anemia, the disease cannot be regarded as benign. Hematuria, crises with anemia, and splenic infarction resultant from aerial flight, as illustrated in this case history, are common complications. In an analysis of 16 persons with sickle cell-Hb C disease, Smith and Conley[10] observed roentgenographic evidence of aseptic necrosis of the femoral or humeral heads in five. The same authors reported severe exacerbations of symptoms during pregnancy and two post-partum deaths from hemorrhage. Thrombocytopenia, as observed in our patient, has not been a characteristic finding in the reported cases of this syndrome.

Infarction of the spleen during airplane flight has been observed in six cases of electrophoretically proven sickle cell-Hb C disease.[16-18] A clinically diagnosed infarct occurred in our patient after a commercial airline flight. The occurrence of a similar episode in this patient after high-altitude land ascent by train (to approximately 5,000 feet above sea level) illustrates the apparent extreme sensitivity of these persons to minor degrees of hypoxia.

SUMMARY AND CONCLUSIONS

A case of sickle cell-hemoglobin C disease is presented, together with a brief review of the clinical, hematologic, and electrophoretic findings in this syndrome.

Observation of a Negro patient with symptoms of "atypical" sickle-cell anemia, splenomegaly, sickling, and numerous target cells in peripheral blood smear should suggest the possibility of sickle cell-hemoglobin C disease. The diagnosis can be confirmed by the relatively simple technic of paper electrophoresis.

ACKNOWLEDGMENT. The authors are indebted to William P. Jencks, First Lieutenant, MC, USAR, Walter Reed Army Institute of Research, for the electrophoretic studies.

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Fatty Liver and Fat Embolism

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FAT EMBOLISM following trauma, such as fracture of a large bone, has occasionally proved fatal. Fat embolism from fat-filled hepatic cells and cysts occurs in both man and animals, but only rarely has been thought to cause death. A recent case of fatal ethyl alcohol poisoning was studied. Multiple fat emboli were present in the brain, lungs, heart, and kidneys. Massive fatty metamorphosis of the liver was presumably the source from which these emboli arose.

CASE REPORT

This 47-year-old man was dead on arrival at this hospital. Thirty minutes previously a friend had requested an ambulance because the patient appeared critically ill. He apparently was dead when the ambulance arrived. The body was brought to the hospital for examination, and death was confirmed by the emergency room physician.

Autopsy

Gross findings. The body was that of a moderately well-developed but severely emaciated man. Jaundice was not evident. When the body was opened, a strong odor of alcohol was noted. No free fluid was present within the peritoneal or thoracic cavities. The lungs weighed 1,400 grams. Several areas of purplish-red discoloration were seen on the pleural surfaces of both lungs in their posterior thirds. These areas were slightly sunken beneath the surface. All lobes of both lungs were very firm. The mucosa lining the major bronchi was bright red. The bronchi of the left lung contained moderate quantities of granular, yellowish-white material. The other bronchi contained frothy, bright-red fluid. No thrombi or emboli were noted in the pulmonary arteries or veins.

The atrial foramen ovale was anatomically patent with an ostium 2 mm in diameter. The liver weighed 2,310 grams. Its capsular surface was smooth and glistening. The parenchyma was soft, bright yellow, and greasy. The pancreas and adrenal glands were normal in appearance.

The external surfaces of both kidneys were marred by large, flat-based scars, the largest of which measured 4 by 2 cm in surface extent

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with a depression of 0.3 cm below the adjacent cortical surface. Attached firmly to such scars were large quantities of perirenal fat and fibrous tissue. On section both kidneys appeared to be shriveled and the parenchyma was greatly thinned. The renal pyramids were flattened and the calyces were greatly dilated. The cortex measured a maximum of 3 mm in thickness and, in areas of extreme thinning, the corticomedullary junction was indiscernible. Both ureters were dilated, tortuous, and elongated.

The surface vessels of the brain were conspicuous and engorged. The leptomeninges were slightly thickened by irregular deposits of grayish-white, opaque tissue.

Histological findings. In both lungs multiple clusters of alveoli were filled by an exudate of polymorphonuclear leukocytes, large mononuclear cells, serum, and a few extravasated erythrocytes. The blood vessels were moderately engorged. Stainable fat was present within small arteries and within alveolar capillaries (fig. 1), and occasionally it was demonstrable within the alveolar lumen. Using Kent's[1] classification this extent of fat embolism was considered approximately 2 plus. Occasionally, fat was found within the cytoplasm of macrophages.

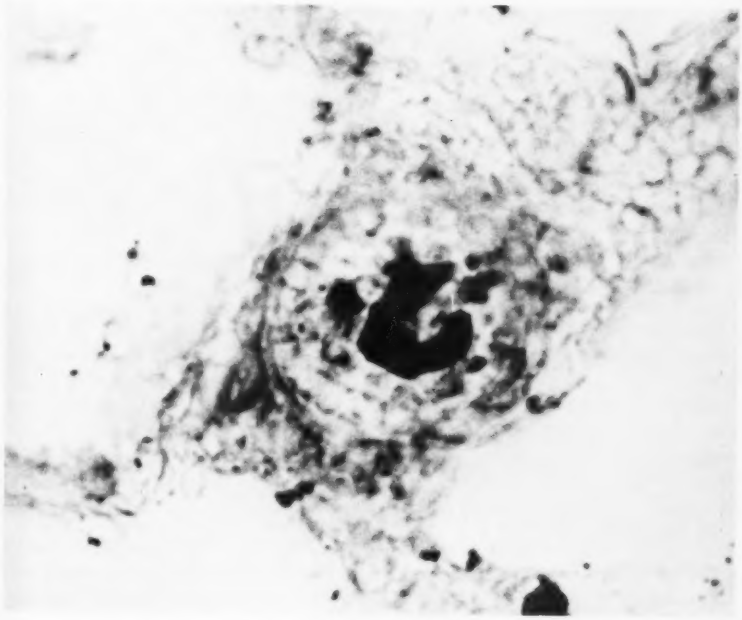

Figure 1. Frozen section of lung showing fat (black) in the lumina of a small artery in the center and a capillary at the margin of the photograph. (Oil red O stain, × 350)

Sections from the myocardium showed slight fragmentation, vascular engorgement to a slight degree, and occasional fat vacuoles within capillaries. Nearly all of the hepatic cells contained large intracytoplasmic fat vacuoles. A few lobules showed central collections of polymorphonuclear leukocytes. Similar inflammatory cells were noted in the portal areas. Fatty cysts were present (fig. 2).

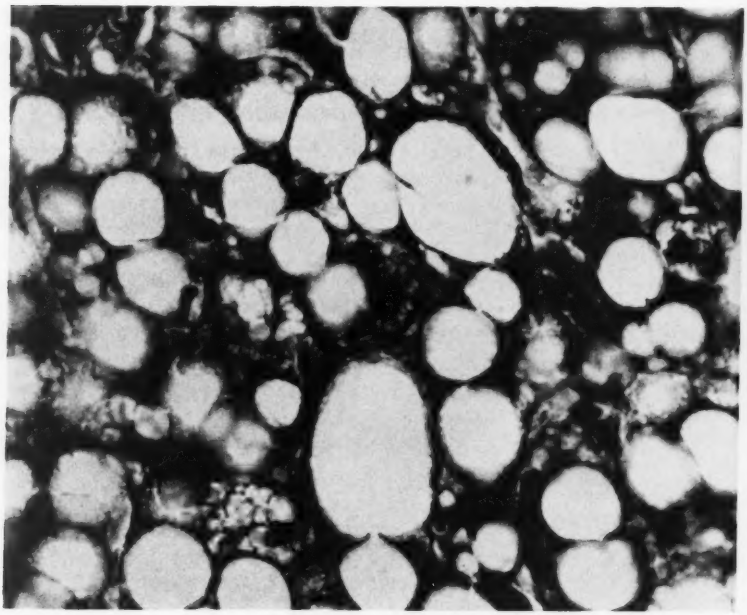

Figure 2. Section of liver showing fatty metamorphosis and fatty cyst formation. (Hematoxylin and eosin stain, × 400)

Sections from both kidneys showed irregular areas in which there was a marked increase in interstitial fibrous connective tissue, infiltration by lymphocytes, and replacement of many glomeruli by balls of partially hyalinized fibrous connective tissue. Colloid casts were seen in some of the tubules. Blood vessel walls were moderately thickened due to fibrous tissue proliferation. Occasional glomeruli showed slight pericapsular fibrosis. Stainable fat was present within many glomerular capillary loops and, occasionally, within small arteries (figs. 3 and 4).

Toxicological examination showed 3.15 mg of ethyl alcohol per gram of brain tissue, or 0.315 per cent. The gastric content showed 10.2 mg of ethyl alcohol per ml of gastric content, or 2 ml in 150 ml of specimen. Gettler and Tiber[2] gave 0.27 to 0.51 per cent as the lethal range of ethanol in brain tissue.

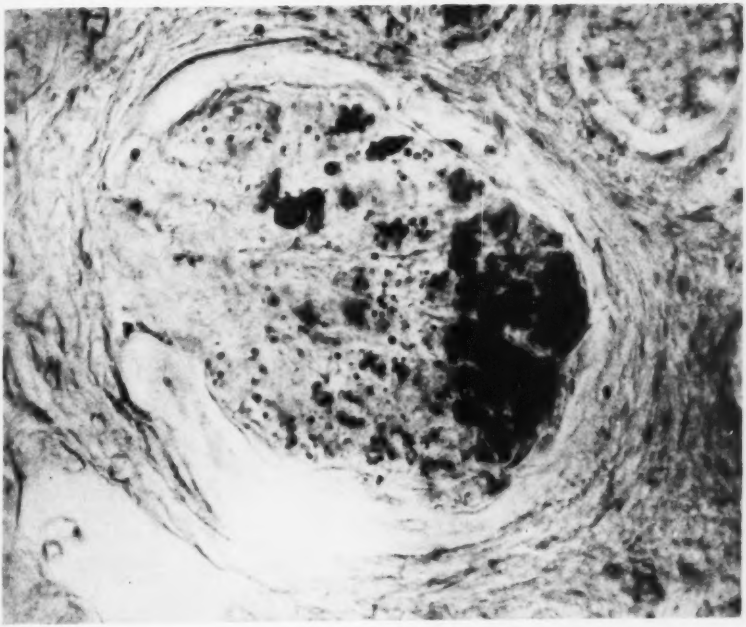

Figure 3. Frozen section of kidney. Fat emboli (black) plug the capillary loops beneath the glomerular capsule on the right. (Oil red O stain, × 350)

DISCUSSION

The significance of fat emboli is still debated. Kent studied 53 nondiabetic and nontraumatized adult patients who had come to autopsy. He found a very occasional fat embolus in the lungs of 10 cases. These were multiple in one case. In 53 diabetics, fat emboli were found in the lungs of 24, rare in 19, in more than one location in 2, and in almost every low-power microscopic field in 3. He believed that the emboli were of no clinical significance in either group.

Hedren[3] is said to have reported a fatal pulmonary fat embolism in one diabetic patient. Durlacher and associates[4] studied 25 cases of sudden death in persons with alcoholic fatty liver. Five of the deaths were attributed to massive pulmonary fat embolism. Fat emboli in the lungs of three other patients were not thought to be the cause of death. Graham,[5] in reporting a group of young adults with fatty liver and sudden death, did not mention the presence of fat emboli. MacMahon and Weiss[6] found microscopic fat emboli in the pulmonary artery of a patient who died from carbon tetrachloride poisoning.

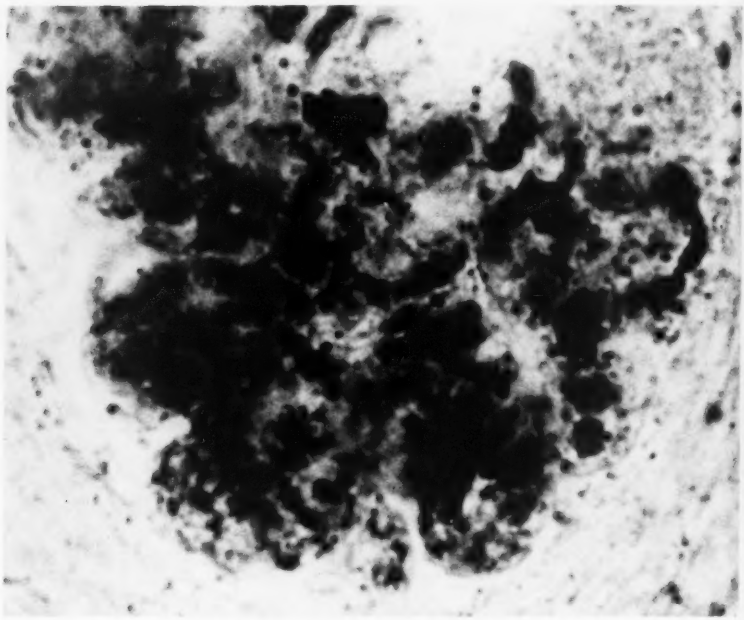

Figure 4. Frozen section of kidney. Fat emboli (black) plug the majority of the capillaries of the single glomerulus shown. (Oil red O stain, × 500)

The pathogenesis of the lesion has been well worked out in animals and in man. In working with choline-deficient rats, Hartroft[7] and Hartroft and Ridout[8] showed that the liver cells become engorged with fat, the cell wall ruptures, and neighboring cells coalesce to form fatty cysts. These, in turn, may rupture and discharge globules of fat into the hepatic sinusoids, whence they are carried to lungs, brain, kidneys, and heart. A similar course of events is known to occur in man, but significant embolization of fat apparently is rare.

In the case reported above, we do not feel justified in attributing death to multiple fat emboli. Acute alcohol poisoning was present with lethal tissue concentrations. The fatty liver was certainly the source of the many fat emboli to lungs, kidneys, myocardium, and brain. Fatty liver is a common accompaniment of chronic alcoholism, but may occur with other conditions.[9] The hazard of repeated small emboli to vital organs is probably more important than the risk of significant sudden massive pulmonary embolization, because the latter is so uncommon. Patek, Segal, and Bevans[10] found intercapillary glomerulonephritis to be much more frequent in cirrhotic patients than in the general population.

They did not consider the possibility of repeated fat embolization from the liver to the kidneys. However, experimental production of fat emboli in choline-deficient rats has resulted in lesions which simulate both the focal and diffuse types of lesions seen in the Kimmelstiel-Wilson syndrome. The liver was considered the probable source of the emboli.[11]

The detection of fat emboli requires foresight of the pathologist, and special handling of the tissue at the time of autopsy. It is to be expected that if it is more frequently sought, the lesion will be encountered more often and its importance more accurately defined.

SUMMARY

The autopsy findings in a man who died suddenly, apparently of acute ethyl alcohol intoxication, included marked fatty metamorphosis of the liver with fatty cyst formation. Microscopic fat emboli were found in the renal, pulmonary, cardiac, and cerebral tissues. These emboli were not thought to have been an important factor in the sudden death of this patient, but do illustrate a probable mechanism by which the fatty liver may produce changes in the kidneys and possibly other viscera.

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Epidural Intracranial Abscess

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EPIDURAL intracranial abscess, uncomplicated by other intracranial infection and not associated with osteomyelitis of the skull, is uncommon.[1-7] The case reported here is the only one seen at this hospital in the five years it has been in operation, during which period the yearly patient admission rate averaged 20,000.

CASE REPORT

The patient, an 18-year-old airman, was in good health until 15 June 1955, when he noted the onset of mild right frontal headache. No other symptoms of sinusitis were present. Several physical and neurologic examinations apparently were negative, and the patient was treated as an outpatient with mild medication for headache. About two weeks later, however, he noted the onset of a low-grade fever for the first time and a considerable increase in the severity of his headache. That night, the patient became acutely ill. His temperature on admission to the local medical facility was over 104°F, and he was maniacal. Neurologic examination revealed no localizing findings. He did not have a stiff neck. Antipyretic therapy and 180 mg (300,000 units) of penicillin were given every four hours.

The following day a spinal tap revealed a pressure of over 300 mm of water. Examination of the spinal fluid revealed 109 lymphocytes per 100 ml; sugar, 91 mg per 100 ml; and total protein, 22 mg per 100 ml. Smear and culture studies were negative, as was a blood culture. His white blood cell count was 12,250 per μl with 73 per cent polymorphonuclear neutrophil cells. The blood sedimentation rate was 34 mm/hr. The remaining laboratory studies were within normal limits.

Following the spinal tap, the patient noted rather dramatic relief from his headache. Streptomycin sulfate and sulfadiazine (dosage unrecorded) were added to the penicillin he was already receiving. Within 48 hours the patient was asymptomatic. Antibiotic therapy was continued for a total of seven days and then discontinued. Because he remained symptom-free and a repeat spinal fluid examination was entirely negative, he was discharged on the eleventh hospital day.

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The patient remained well until three weeks later, when a recurrence of the right frontal headache developed. Neurologic examination on readmission was said to be negative, but the patient was running a low-grade fever. Spinal fluid study revealed an initial pressure greater than 310 mm of water. Ten lymphocytes per 100 ml were present, and smear and culture studies again were negative. No medication was given during this hospitalization. Despite a persistent lack of focal neurologic findings, the headache and low-grade fever persisted and manometric study revealed a steadily increasing spinal fluid pressure up to 690 mm of water.

On 10 September 1955, the patient was transferred to the department of neurology at this hospital, where the previously mentioned findings were verified. Agglutination studies, roentgenograms of the skull, and numerous electroencephalograms were normal. Spinal fluid dynamics revealed an initial pressure of 480 and a closing pressure of 190 mm of water. Unfortunately, the laboratory report of studies on this fluid was lost.

Repeat neurologic examinations eventually disclosed a slight but definite papilledema, although localizing signs remained absent. A tentative diagnosis of brain tumor or brain abscess was made, and the patient was transferred to neurosurgery. A right carotid percutaneous angiogram failed to reveal any definite abnormality (fig. 1). This was followed by ventriculography, which demonstrated ventricular displacement to the left, as seen in figure 2. A right frontal craniotomy was immediately performed. When the lowermost bur hole, situated just above the supraorbital ridge near the mid-line, passed through the inner table, thick creamy yellow pus welled up out of the wound. Culture later produced a pure growth of a nonhemolytic coagulase-negative staphylococcus organism. An estimated 100 ml of pus was flushed from the wound. A frontal flap was turned and a large, well-organized abscess capsule was seen overlying the dura of the frontal pole. A dome-like elevation of the dura was opened, but normal appearing brain was encountered. This dural defect was closed after liquid bacitracin was instilled subdurally. A considerable amount of bone in the supraorbital area was rongeured away and a generous portion of the bone flap was sawed free and discarded. The epidural space was thoroughly débrided and irrigated. Bacitracin solution was instilled therein and the wound was closed. A small rubber drain was left in the epidural space, being exteriorized through a small incision in the scalp flap.

The patient tolerated the procedure very well. He had been given 600 mg (1,000,000 units) of penicillin and 1 gram of streptomycin sulfate at the time of the operation. This was later changed to chlortetracycline hydrochloride (aureomycin) when sensitivity studies were reported on the staphylococcus organism.

The drain was removed after five days, but rather profuse drainage persisted for several weeks. Antibiotic therapy was altered to Chloro-

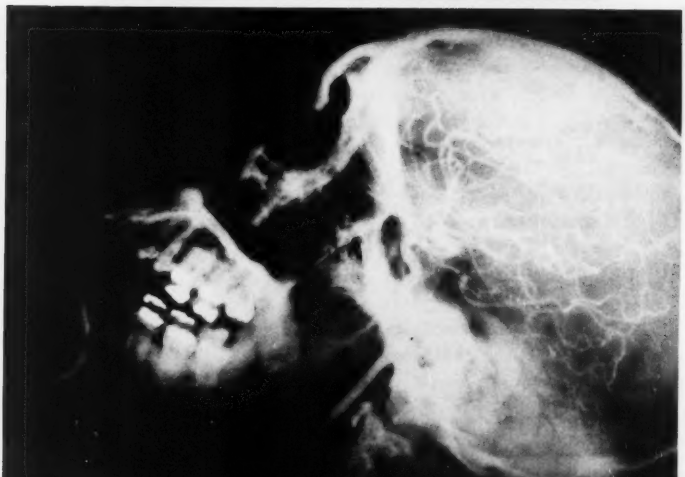

Figure 1. Angiogram which failed to definitely reveal the presence of the extradural frontal abscess mass.

mycetin (brand of chloramphenicol) in accordance with later sensitivity studies. Antibiotic therapy was continued for five weeks.

Figure 2. Ventriculogram showing ventricular displacement to the left.

The patient has remained symptom-free to date (10 February 1956). Careful study of the bone fragments by the pathology department did not reveal evidence of osteomyelitis.

SUMMARY AND CONCLUSIONS

Epidural intracranial abscess without other intracranial infection and without osteomyelitis of the skull is uncommon. In addition, the above reported instance of this disease presented two features which are instructive. It illustrates the difficulty of early diagnosis of epidural brain abscess (1) when there is no overt evidence of a primary source of infection and (2) when the development of intracranial complications of ear and sinus infection is masked and localized by antibiotic therapy.[8,9] The failure to develop even a minimal amount of osteomyelitis of the

skull was probably due to early antibiotic therapy. As is usual in epidural abscesses,[9] a micrococcus (staphylococcus) organism was isolated.

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PSYCHOTHERAPY?

"There was an Army doctor I once knew who had discovered, and practised, a very useful therapy for malingerers. He would listen attentively to their imagined symptoms, then examine, with an air of increasing gravity, some unexpected portion of their anatomy. He was, if I remember rightly, an Irish doctor. He would tell the man to return to duty, and report again in three days' time: 'For if you are no better, I'm afraid there's nothing for it but an operation.' And he would lightly describe an operation compared with which the martyrdom of a Christian saint was no more than a summer cold.

—ERIC LINKLATER
in *British Medical Journal*
p. 1519, Dec. 24, 1955

Tietze's Syndrome

REYNOLD E. KLAGES, Jr., *Captain, USAF (MC)*

TIETZE'S syndrome is a nonsuppurative, nonspecific, painful, benign swelling of the costochondral or the sternoclavicular junctions. About 30 years ago it was originally described in the German literature.[1] It seems justifiable to include this condition in the differential diagnosis of chest pain.

As is noted in the literature, this particular syndrome usually occurs in persons between the ages of 18 and 40 years, but it has been reported in individuals as old as 60 years. In the service, both military personnel and their dependents often are seen at the hospital or clinic with the complaint of "pain in the chest." Due to the now-recognized fact that cardiovascular changes can occur at any early age and that the public is much more conscious of this, it is incumbent upon physicians to differentiate the serious from the benign conditions that produce chest pain. It therefore seems timely to report a case of Tietze's syndrome observed at this hospital.

CASE REPORT

A 19-year-old married white woman was first seen in the dependent's clinic on 10 February 1955 because of persistent pain in the upper right chest. The patient stated that she had been perfectly well up until about two months earlier, at which time she noted an enlargement in the area that anatomically would be considered the right sternoclavicular joint. For the past month the area had been extremely painful; about one week before she came to the clinic the pain increased in severity. There was no history of falls, blows to the chest, heavy lifting, or wrenching or pulling of the right shoulder girdle. The onset was insidious, the patient first noting tenderness one morning when rolling over on her right side in bed. Upon examining herself in the mirror she saw a slight lump in this area. It was more painful on arising in the morning and on moving the right shoulder girdle, and during the day and toward evening the soreness would improve slightly. She used hot Epsom salts compresses, to no avail. She had taken no medication orally before coming to the clinic.

From U. S. Air Force Hospital, Hunter Air Force Base, Ga.

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Her past history was noncontributory. She had the usual childhood diseases except mumps. She had had no operations and had borne no children. She had always been in excellent health. There was no family history of tuberculosis, diabetes mellitus, or other familial diseases.

Physical examination on admission revealed a well-developed, well-nourished white woman in no acute distress. Temperature was 98.6°F; pulse rate, 88/min; respiration, 20/min; blood pressure, 120/74 mm Hg. There was a firm, slightly tender, bulbous mass at the right sternoclavicular joint. The patient was able to move the right shoulder girdle in all directions without limitation. The mass was about 2 by 3 cm, smooth, and slightly raised. It was not movable, and there was no crepitation. There was no evidence of dislocation of the right shoulder girdle or sternoclavicular joint. The lungs were clear to auscultation and percussion. The heart tones were of good quality, sinus rhythm was regular, and no shocks, thrills, murmurs, or accentuation were noted. The remainder of the physical examination was within normal limits.

The laboratory studies revealed a red blood cell count of 4,500,000/μl; hemoglobin, 15 g/100 ml; and white blood cell count, 10,500/μl, with 92 per cent neutrophils. Sedimentation rate was 20 mm per hour (Wintrobe). The serologic test was negative. Blood urea nitrogen was 15 mg/100 ml, and total protein was 7.5 g/100 ml (albumin 4.5, globulin 3.0). Urinalysis was negative for sugar and bile, and the microscopic examination was negative. Prothrombin concentration was 100 per cent of normal; fasting blood sugar, 110 mg/100 ml; calcium, 9.5 mg/100 ml; uric acid, 3 mg/100 ml; cholesterol, 200 mg/100 ml; and inorganic phosphorus, 4 mg/100 ml. Chlorides were 104 meq/l; sodium, 140 meq/l; and potassium, 4.5 meq/l. Liver function tests were within normal range. The electrocardiogram, consisting of all 12 leads, was reported as being within normal range. Roentgenograms of the chest and the right sternoclavicular area were within normal limits.

The patient was given no medication. During the next few weeks the lesion decreased in size, and on the next to last visit there was a very slight residual tenderness upon deep pressure. On her last visit, about six weeks after the first, there was no discomfort either on digital pressure or as a result of right shoulder girdle motion. Physical examination was entirely negative, and there was no evidence that there had been a lesion in this area.

DISCUSSION

The patient with Tietze's syndrome usually complains of a painful sensation in the chest area. The discomfort may be vague, nondescript, and diffuse or fairly well-localized. The patient may describe it as a heavy weight that seems to be pushing

in on the chest, or it may be described as only a soreness which is present on deep respiration. The intensity of the pain may be more severe at different times of the day. Several factors, including anxiety, weather, type of work, infection, et cetera, apparently aggravate the condition.

Tietze's syndrome should be considered in the evaluation of chest pain because of the similarity of its symptoms to those of many different organic diseases. The differential diagnosis should include such serious conditions as carcinoma of the lung or breast and any of the serious cardiac conditions that might mimic the pain of Tietze's syndrome. Trauma in any form should be ruled out by history, physical examination, and roentgenograms.

Hodgkin's disease should be considered in the differential diagnosis because it may produce sternal swelling at the level of the second and third intercostal spaces as a result of involvement of the nodes along the course of the internal mammary artery.[2] However, in Hodgkin's disease there is no sternal tenderness, in contrast to the painful condition found in Tietze's syndrome. Osteochondritis can be differentiated radiologically;[3] mumps with presternal edema can be differentiated for it is not tender and usually lasts only five days.[3] All of these characteristics are quite different from those found in the swelling of Tietze's syndrome.

Following the exclusion of a serious lesion two other conditions which should be thought of in relation to chest pain from a superficial cause are slipping rib[4] and nerve nipping at the intercostal margin. These can generally be differentiated by careful physical examination and should cause no confusion.

Reports of the microscopic characteristics of the lesion are inconsistent and indefinite. Biopsy specimens may show thickening of the perichondrium, muscle fascia, and/or ligaments surrounding the costochondral junction, and at times an enlargement of cartilage around the joint involved. All of the reports indicate an absence of inflammatory change in cartilage and surrounding soft tissue. It is believed that all of the reported histologic changes could be normal variations of the costal cartilage.

On examination the findings are limited to the areas about the involved costochondral or sternoclavicular junctions. As was noted in this case report there is usually a tender, fusiform, or bulbous swelling involving the soft tissue, cartilage, or bone. The skin above the involved area is not changed or discolored, and there is no crepitation nor pitting edema. Radiologic findings of significance are rarely noted.

The course of the disease varies, according to the reports.[6] It may be long and varied with remissions and exacerbations, or it may be quite short, a matter of days or weeks.

The treatment is entirely symptomatic and consists of local application of heat, the use of salicylates for pain, and if necessary, infiltration with a local anesthetic. The patient should be reassured that the condition is benign, that it will heal in time, and that no residual damage is anticipated.

This case report is typical of those recorded in the literature. The onset was insidious, and there was no apparent cause of the lesion. No treatment was given, and after about four months the patient was asymptomatic and physical examination was normal.

SUMMARY

A case of nonspecific, painful swelling of the sternoclavicular joint has been presented as an example of Tietze's syndrome. The cause of this condition is unknown, and it has a variable and often prolonged and fluctuating course. Since this syndrome is not believed to be rare, it should be considered along with more serious disorders in the differential diagnosis of chest pain. It is of particular importance that these patients be reassured of the benign nature of the disorder.

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A MESSAGE FROM THE A. M. A.

With the 85th Congress convening this month, the American Medical Association will continue to be kept busy following congressional activity, particularly in areas concerning medicine and public health. There has been an increase in the total measures introduced and laws enacted in the last two Congresses. Medical and health bills, as well as enacted laws, likewise increased. The following table indicates the extent of these activities:

Legislation	83d Congress (1953-1954)	84th Congress (1955-1956)	Increase (Per cent)
Measures introduced			
Total	16,372	19,039	16
Concerning medicine	407	571	40
Public laws enacted			
Total	781	1,028	31
Concerning medicine	20	26	30

When the 84th Congress completed its second and final session on 26 July 1956, over 19,000 measures had been introduced. The Association analyzed and closely followed 571 of these bills which had medical or health implications. Most of the 26 medical measures which became law were supported by the Association by oral or written statements presented to the committees or members of Congress.

The Association opposed two measures which became public laws in 1956. One amended the Social Security Act by establishing a disability cash benefit program for persons between ages 50 and 65; the other authorized medical corps commissions for osteopaths in the armed services, but on a permissive basis.

There were six military medical laws enacted by the 84th Congress. Two were enacted in the first session and four in the second session. It is believed that medical officers will be interested in the following general summary of these laws.

Public Law 118, 30 June 1955, extended the Doctor Draft Act for two years until 1 July 1957, which the Defense Department

From the Council on National Defense of the American Medical Association. The views and opinions expressed are not necessarily those of the Department of Defense, —*Editor*

claimed was essential to get enough physicians to maintain high standards of medical care for military personnel. It also extended, for four years, the $100-a-month equalization pay for physicians and others on active military duty. Reflecting some of the objections of the American Medical Association in opposing an extension of the Doctor Draft Act, it amended the law by (a) lowering the age limit for call-up of special registrants from 51 to 46 years of age, and (b) exempting from induction special registrants over the age of 35 who had previously applied for commissions as medical or dental officers in one of the armed services, if they had been rejected solely on the basis of a physical disability.

The Department of Defense has indicated to the Association that it will not seek an extension of the Doctor Draft. Legislation has been proposed to amend the basic Universal Military Training and Service Act to provide for the selective call-up of physicians, along with others who have general draft liability. Under the present basic draft act, physicians who have been deferred beyond age 26 to complete their medical education are liable for service up to age 35. The proposed legislation is designed to provide for an orderly call-up of these deferred physicians.

Public Law 294, 9 August 1955, authorized reserve commissions, for the first time, for male nurses in the armed services. The A. M. A. took no position on this legislation.

Public Law 492, 27 April 1956, authorizes the President to make the U. S. Public Health Service a military branch in time of emergency involving the national defense. Prior to this, such status was permissable in time of war, but not in time of emergency. The Public Health Service considered this change necessary to discharge adequately its new civil defense responsibilities. After the Surgeon General of the Public Health Service assured the Association that the proposed legislation would not be used for the purpose of placing calls for civilian physicians with the Selective Service System in time of national emergency, the American Medical Association then supported the measure.

Public Law 497, 30 April 1956, was designed to increase the career attractiveness of military medicine. In addition to the $100-a-month equalization pay, medical officers, under the law, receive an additional increase in pay of $50 at the end of 2 years' service, another $50 at the end of 6 years' service, and another $50 at the completion of 10 years' service. The original version of the bill provided for the first pay increase at the end of 3 years. As finally enacted, it included the A. M. A. recommendation for an increase at the end of 2 years. Another A. M. A. recommendation not included in the law called for an increase

in the amount of special pay to more nearly equalize military salaries with the salaries offered physicians of equal training and experience as civilian employees of the government.

Other features of the law provide for longevity pay credit for the 4 postgraduate years spent in medical schools and for the 1 year spent in medical internship, as well as upgrading of officers now on the active list to reflect the 1-year increase of constructive service credit.

Public Law 569, 7 June 1956, authorizes a uniform program of medical care for members of the uniformed services and their dependents. The Dependents' Medical Care Act authorizes medical care of all military dependents in military facilities subject to availability of space, facilities, and capabilities of staff. The Secretary of Defense is authorized to arrange for medical inpatient care for spouses and children of active duty personnel in civilian medical facilities. The civilian facilities may be limited or prohibited in any area where it is determined that military facilities are adequate to care for the service families. Charges in military facilities are limited to subsistence and in-hospital charges, together with uniform, minimal charges for outpatient care. In private facilities, the charges will be at the same rate or the first $25, whichever is the larger. The law defines "military dependents," as well as the types of benefits provided in military and in civilian facilities. In supporting this program and pledging its complete co-operation, the A. M. A. urged that increased emphasis be placed on the utilization of civilian facilities and the services of civilian physicians.

Public Law 763, 24 July 1956, is a permissive law authorizing the appointment of osteopaths as medical officers in all the military services. The American Medical Association opposed this measure, because it believed that the appointment of osteopaths as medical officers would endanger the health and welfare of military personnel, would contribute to the demoralization of the career services, would endanger the accreditation of residencies and internships in military hospitals, and would unnecessarily hinder the utilization of civilian consultants and other civilian physicians.

COMMITTEE ON NUTRITION VISITS EUROPE AND MIDDLE EAST

Members of the Committee on Nutrition for National Defense recently completed a survey of countries in Europe and the Middle East. Dr. Frank B. Berry, Assistant Secretary of Defense (Health and Medical) and Chairman of the Committee, was accompanied on the 28-day tour by Rear Admiral Bartholomew W. Hogan, MC, USN, Surgeon General, U. S. Navy; Major General James O. Gillespie, MC, USA, Office of the Surgeon General, Department of the Army; Major General Harry Armstrong, USAF (MC), Surgeon, Air Force Europe; Dr. Arnold E. Schaefer, Deputy Director, Interdepartmental Committee on Nutrition for National Defense; Dr. Joseph S. Butts, Oregon State College, Corvallis, Oreg., consultant to the Interdepartmental Committee; Dr. Olaf Mickelsen, National Institutes of Health, Bethesda, Md.; Dr. Richard A. Kern, Temple University Hospital, Philadelphia, Pa.; and Dr. Edward D. Churchill, John Homans Professor of Surgery, Harvard Medical School, Boston, Mass.

Committee arriving in Washington, D. C., on their return from the Middle East. From left to right: Dr. Arnold E. Schaefer; Major General James O. Gillespie, MC, USA; Lieutenant Commander Thomas L. Hollis, MSC, USN; Rear Admiral Bartholomew W. Hogan, MC, USN; Dr. Joseph S. Butts; Lieutenant James W. Staudaher, USA; Dr. Frank B. Berry; Dr. Edward D. Churchill; Dr. Richard A. Kern; Dr. Olaf Mickelsen.

The group studied nutritional problems and dietary deficiencies in France, Greece, Turkey, Lebanon, French Morocco, Iran, Pakistan, Eritrea, Ethiopia, and Libya. At Teheran, Iran, the committee met with the Surgeons General of Iraq, Turkey, Iran, and Pakistan to discuss nutritional problems in those countries.

While on the trip the committee also reviewed medical care provided for U. S. Military Assistance Advisory Group (MAAG) in the areas visited.

DEATHS

BARCLAY, Robert Maxwell, Lieutenant Colonel, DC, USAR; of Glenshaw, Pa.; stationed at 665th Medical Detachment, Korea; graduated in 1938 from Northwestern University Dental School; commissioned a First Lieutenant 8 October 1940 and ordered to active duty 1 July 1942, released from active duty in 1945, and returned to active service 13 October 1953; died 6 October 1956, age 44, in Korea, of acute anterior myocardial infarction.

YOUNG, Grayce Esther, First Lieutenant, ResAF (AFNC), of Warren, Ohio; stationed at 4457th U. S. Air Force Hospital, Sewart Air Force Base, Tenn.; graduated in 1949 from Saint Vincent's Charity Hospital School of Nursing, Cleveland, Ohio; ordered to active duty 5 August 1955; died 26 October 1956, age 28, in an aircraft accident.

ERRATUM: The legend under the illustration on page 1830 of the December 1956 issue of this *Journal* should have shown Vice Admiral Roque A. Saldías as President of the Council of Secretaries instead of as Secretary of the Navy of Peru—*Editor*

MEDICAL PERSONNEL GIVEN AWARDS AT MILITARY SURGEONS MEETING

Over 1,800 military medical personnel and civilian physicians attended the 63d Annual Meeting of the Association of Military Surgeons held in Washington, D. C., 12-14 November 1956, under the presidency of Rear Admiral Winfred P. Dana, MC, USN. Among those present were 57 military medical leaders representing 28 foreign nations.

Delegates from 28 foreign nations, and Rear Admiral Winfred P. Dana, MC, USN, President of the Association of Military Surgeons (center).

Highlights of the program included 33 original medical and scientific papers; panel meetings on medical specialist, sustaining membership, dental, veterinary, sanitary engineering, and nursing subjects; 16 scientific and 54 commercial exhibits; and a continuous showing of professional films. Admiral Arthur W. Radford, USN, Chairman, Joint Chiefs of Staff, was guest speaker at the International Luncheon.

Five awards and three Founder's Medals were presented at the honors night dinner. Colonel Eugene C. Jacobs, MC, USA, Commanding Officer, U. S. Army Hospital at Ft. Monroe, Va., won the Sir Henry Wellcome Medal and Prize for his essay, "Tuberculosis: Yet an Unconquered Disease," which will appear in the January 1957 issue of *Military Medicine*, the official organ of the Association.

The Gorgas Medal was awarded to Captain Robert S. Poos, MC, USN, for his outstanding contributions to the control of poliomyelitis among naval personnel and their dependents in Hawaii, and to the use of Salk vaccine under epidemic conditions.

Dr. George M. Lyon, Manager of the Veterans Administration Hospital, Huntington, W. Va., was awarded the 1956 Major Louis Livingston

Seaman Prize for his article, "Radiation Injuries Resulting from Nuclear Explosion and Fallout," which was published in the April 1956 issue of *Military Medicine.*

The Stitt Award was presented to Lt. Colonel Edwin J. Pulaski, MC, USA, for his contributions in antibiotic research, especially the use of antibiotics in burns.

Admiral Arthur W. Radford, USN, Chairman, Joint Chiefs of Staff, giving address at Association meeting.

The McLester Award for outstanding work in nutrition and dietitics was received by Captain Elinor Pearson, AMSC, for her metabolic studies of severly burned patients.

Winners of the Founder's Medal were chosen by the Executive Council of the Association from members who have made outstanding contributions to military medicine and performed meritorious service to the Association. Those who received the medal for 1956 were:

Major General George E. Armstrong, USA (Ret.), former Surgeon General of the Army (1951-1955), now Director of New York University-Bellevue Medical Center, New York, N. Y.

Captain Eugene V. Jobe, MC, USN, Bureau of Medicine and Surgery, Department of the Navy, Washington, D. C.

Captain Walton L. Jones, MC, USN, Bureau of Medicine and Surgery, Department of the Navy, Washington, D. C.

BOOKS

Reviews of Recent Books

ADVANCES IN INTERNAL MEDICINE, Volume VIII, edited by *William Dock*, M. D., and *I. Snapper*, M. D. 366 pages; illustrated. The Year Book Publishers, Inc., Chicago, Ill., 1956. Price $9.

This eighth of a series deals with eight subjects in review form, of which some are universal in interest and others more or less exotic in nature.

"Disorders of Esophageal Motor Functions," by F. J. Ingelfinger, is a lucid presentation of the anatomy and physiology of the esophagus. Based on this data, a realistic therapeutic approach has been formulated.

"Peptic Ulcer: Review of Recent Literature Pertaining to Etiology, Pathogenesis, and Certain Clinical Aspects," by J. B. Kirsner, R. S. Kassriel, and W. L. Palmer, gives an excellent summary of the literature for the past five years. The review of incidence, the role of hydrochloric acid and the relations of serotonin and reserpine, plus the problem of massive gastro-intestinal hemorrhage are interestingly discussed. Clinical indications for transfusions and surgical intervention are clearly given. A reasonable, conservative approach to the problem of gastric ulcer is offered.

"Digitalis and Potassium," by B. Lown, is a key paper for anyone undertaking the treatment of cardiac patients. Potassium metabolism is explained, and factors enhancing myocardial sensitivity to digitalis following potassium deficit are enumerated. Finally, the interrelations of calcium, potassium, and digitalis are shown.

J. A. Luetscher, Jr., discusses "Aldosterone," its pharmacologic actions, extraction and measurement on body fluids, and physiologic effects of its administration.

"Adrenalectomy and Hypophysectomy in the Treatment of Advanced Cancer," by O. H. Pearson, provides a brief résumé of the subject. In the case of carcinoma of the breast, relationship of adrenalectomy to response to oophorectomy and androgen therapy is shown. Preliminary results of hypophysectomy for breast cancer indicated about an over-all 50 per cent improvement. A program for hormone replacement therapy during and after adrenalectomy and hypophysectomy is given.

"Chemotherapy of Tuberculosis," by W. F. Russell, Jr., S. H. Dressler, and G. Middlebrook, is a review of antimicrobial action of drugs, parasite susceptibility, and drug resistance. A most interesting face presented is that of the prophylaxis of primary tuberculosis.

H. A. Schroeder presents papers on "Trace Metals and Chronic Diseases." Five trace metals believed essential for mammalian metabolism —manganese, copper, cobalt, zinc, and molybdenum—are discussed. The possible relation of trace metals to chronic diseases such as hypertension, atherosclerosis, disseminated lupus, and others is suggested.

R. Janet Watson presents "Hemoglobins and Disease" and discusses 11 hemoglobins other than the normal. Seven combinations with normal hemoglobin resulting in a symptomless trait and 14 combinations with other abnormal genes resulting in pathologic conditions are presented.

The best portion of this book, at least for the inquisitive reader, is the extensive bibliography to be found at the end of each review.

—*ARCHIE A. HOFFMAN, Col., USAF (MC)*

ROENTGEN INTERPRETATION, by *George W. Holmes*, M. D., and *Laurence L. Robbins*, M. D. 8th edition. 525 pages; 371 illustrations. Lea & Febiger, Philadelphia, Pa., 1955. Price $10.

For those in the early stages of training in radiology this modest-sized text can perform an important service. The authors do not attempt to be encyclopedic or exhaustive, and by so doing they are able to present basic ideas in relatively brief form. All too often, sometimes, the student bogs down in a massive text or in the periodical literature and is unable to see the forest for the trees. At such times the eighth edition of this well-known work can furnish a quick and lucid re-orientation.

In condensing the material the authors have avoided the temptation to outline and list classifications. Instead, they adhere to a straight expository style with a smooth flow of ideas from one topic to the next. The illustrations are aptly chosen and the technic of reproduction is of the highest quality.

The first chapter on "Confusing Shadows and Artefacts" has much to recommend it to the beginner. Following this introductory effort, the writers successively discuss radiology of bones, joints, chest, and gastro-intestinal and genito-urinary tracts. The final chapter covers fluoroscopic technic and radiation protection.

Within the limits which the book sets for itself with respect to space and expense, it is fair to say that the stated objective, "to present the essentials," is admirably accomplished.

—*JAMES T. BRENNAN, Lt. Col., MC, USA*

Williams OBSTETRICS, by *Nicholson J. Eastman*. 11th edition. 1,212 pages; illustrated. Appleton-Century-Crofts, Inc., New York, N. Y., 1956.

The 11th edition of this book is the most up-to-date obstetrical textbook available. The editor has made many major revisions and deleted much outdated material. Dr. Louis M. Hellman revised several sections, including anesthesia and analgesia, uterine inertia, and rupture of cesarean section scars. An excellent chapter on the psychiatric aspects of pregnancy and childbirth is presented. The book has been made more

attractive to the reader by addition of many excellent new illustrations, several of which are in color. The new material presented on Rh incompatibility is excellent. There are new or improved sections on fibrinogenopenia, postmaturity, hypotensive drugs, retrolental fibroplasia, adrenocortical hormones, and management of habitual abortion. The section on iron metabolism and anemia in pregnancy and the treatise on the toxemias of pregnancy are attractive presentations. The bibliography has been brought up to date and is quite extensive.

As an obstetric text it is unsurpassed; it not only appeals to the student, intern, and resident but is especially satisfactory to the teacher, general physician, and the specialist.—*J. WILSON HUSTON, Capt., MC, USN*

TECHNIQUES AND PROCEDURES OF ANESTHESIA, by *John Adriani,* M. D. 2d edition. 568 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1956. Price $8.75.

Dr. Adriani has revised the original 1947 edition by several additions and has deleted technics which have not proved useful. The text consists of nine parts, totaling 535 pages, which cover the field of anesthesiology. Included in these nine chapters are selections on anesthesia, specialized procedures, and resuscitation and inhalation therapy. Each part is devoted to the methods and uses of those agents under discussion. Complications of anesthesia are discussed in a separate chapter, while the short appendix offers tables of ordinary laboratory values and cardiac hemodynamics.

The text is unusual as it presents information in outline form, with check lists for almost any situation. These check lists cover in precise fashion indications and contradictions, advantages and disadvantages, premedication, methods, and technics. Selection of anesthesia is covered in a table indicating problems encountered or anticipated, choice of agent, and choice of technical procedure.

The book is well illustrated and adequately referenced, and the author suggests its use by beginners. I believe this work also merits the attention of the expert who desires a time-saving reference and would recommend it for the library of all practicing anesthesiologists.
—*ROBERT F. CORWIN, Col., USAF (MC)*

PHYSICAL DIAGNOSIS, by *Ralph H. Major,* M. D., and *Mahlon H. Delp,* M. D. 5th edition. 358 pages; illustrated. W. B. Saunders Co., Philadelphia, Pa., 1956. Price $7.

This is a revised edition of a widely used textbook in physical diagnosis. It includes for the first time Dr. Mahlon H. Delp as the co-author.

There are sixteen chapters, and an interesting introduction includes a brief history of physical diagnosis and its major contributors. The book is so subdivided and classified that it may be studied as a text in the order written or in any desired fashion. It is recommended reading for all practitioners of medicine, but not intended as a reference book or encyclopedia. Possibly for this reason, details and discussion of the

fundamentals and methods of palpation, percussion, and auscultation at times have been excessively abbreviated. This is a highly recommended text which will undoubtedly receive the same wide approval the previous editions have enjoyed.—*RUFUS J. PEARSON, Jr., Capt., MC, USN*

PROCEEDINGS OF THE INTERNATIONAL CONFERENCE ON THE PEACEFUL USES OF ATOMIC ENERGY, Held in Geneva, 8 August-20 August 1955. Volume 10, "Radioactive Isotopes and Nuclear Radiations in Medicine." 544 pages; illustrated. United Nations Publications, 1956. Distributed by Columbia University Press, New York, N. Y., 1956. Price $8.

This publication, volume 10 of a 16-volume series, records the proceedings of the International Conference on the Peaceful Uses of Atomic Energy held at Geneva, Switzerland, from 8 to 20 August 1955 under the auspices of the United Nations. Eighty-five original papers, with minor editing, are included as well as appropriate verbatim records of the conference. The papers, by leading authorities of the various countries, cover a wide range of subjects indicating experiences with accepted uses of isotopes as well as suggestions for future studies. The majority of papers are oriented toward direct human applications of diagnosis and treatment in the fields of endocrinology, metabolism, hematology, and cancer. Excellent papers are also presented in the general fields of biochemistry, nutrition, and public health, including studies in mosquitoes and helminths. Other than for the few frankly review papers, all material is heretofore unpublished data, representing variations in methodology or adaptations of previously published principles.

One is impressed with the world-wide impact of these relatively new technics in the practice of medicine. With an increasing number of reactors available for isotope production throughout the world, clinical specialists and biologists will have opportunities to use these materials as an aid to understanding their particular problems, as well as those of general interest.

This entire series of books should be a valuable addition to medical libraries for both its historical and technical interest.

—*JAMES B. HARTGERING, Lt. Col., MC, USA*

CHANGING CONCEPTS OF PSYCHOANALYTIC MEDICINE, Proceedings of the Decennial Celebration of the Columbia University Psychoanalytic Clinic, March 19 and 20, 1955, edited by *Sandor Rado*, M. D., D. Pol. Sc., and *George E. Daniels*, M. D. 248 pages. Grune & Stratton, Inc., New York, N. Y., 1956. Price $6.75.

The articles contained in this volume are based on papers presented at the Decennial Celebration of the Columbia University Psychoanalytic Clinic, held in March 1955. The contributors are an erudite group, most of whom are faculty members of the Clinic. The volume sets forth the outstanding accomplishments of this Clinic by infusing an atmosphere of free inquiry into psychoanalysis and by incorporating psychoanalytic technics into graduate medical training in a university setting. The philosphy of training, the selection of students, and the organization of the

curriculum are described. The contents of the book demonstrate the great indebtedness of the faculty to the energy and guidance of Dr. Sandor Rado, whose "adaptational psychodynamics" has been built upon the theories of Freud and realigned them in terms which are biologically oriented. A diagnostic survey is presented of the clinic's case load, with the finding that 59.3 per cent of the applicants for treatment were diagnosed as having schizophrenia. The discussion of diagnostic criteria and the implications of this figure are of great interest.

Psychotherapy is usefully termed as reparative or reconstructive in nature, and the application of these differing therapeutic approaches to clinical cases is described. On a clinical level, the changing concepts of psychoanalysis are dramatically outlined in papers on a Family Study Unit, and on interlocking pathology in family relationships. Such a broad, inclusive approach is also evident in a paper by Kardiner examining adaptational theory from a cross-cultural point of view, and in Glueck's study of psychodynamic patterns in the sexual offender. Perhaps of greatest interest to the reader in showing the wide reorientation of this psychoanalytic group are the papers by Daniels on comprehensive medicine, and by Gerard and Heath on brain physiology and multidisciplinary research in psychiatry.

This is an excellent volume, well written and an excellent commentary on the best of present-day thinking in psychiatric training, treatment, and research. It will be of interest to all working in psychiatry, especially if engaged in teaching and research.— *JOHN C. MEBANE, Maj., USAF (MC)*

PSYCHOANALYSIS OF BEHAVIOR, Collected Papers, by *Sandor Rado,* M. D., D. P. Sc. 387 pages. Grune & Stratton, Inc., New York, N. Y., 1956. Price $7.75.

In this work, Dr. Rado has assembled his personal writings during the period from 1922 to the present. The earliest papers were published in Vienna and London during the time when the author was director of the Berlin Psychoanalytic Clinic. These papers were written under the spell of Freud's influence and are essentially contributions to classical psychodynamics. Perhaps the most valuable of these is "The Psychoanalysis of Pharmacothymia (Drug Addiction)," published in 1933 but a model for those who deal with this problem today.

Dr. Rado has entitled the second portion of his collected papers "Quest for a Basic Conceptual Scheme." The papers in this section were developed after the author had emigrated to the United States and had begun to exert what has become an appreciable influence on the course of psychoanalysis and psychiatry in this country. He had by this time become dissatisfied with Freud's formulations and sought to reconstruct them in a biologic frame of reference. Rado's paper, "Scientific Aspects of Training in Psychoanalysis" (1938), signals his effort to present psychoanalysis as " an empirical clinical science, not an authoritarian, theoretical doctrine." Included in this section is "Pathodynamics and Treatment of Traumatic War Neurosis" (1942), in which the author sets forth a timely and accurate perspective to guide psychiatry during the challenging period of World War II.

In 1946, the author's explorations bore fruit in the development of "Adaptational Psychodynamics." Further contributions to graduate residency training in psychoanalytic medicine were made. "An Adaptational View of Sexual Behavior" and "Emergency Behavior," two of Dr. Rado's greatest contributions, are elucidated in graphic style, well supported by diagrammatic illustrations. In a discussion of "Recent Advances in Psychoanalytic Therapy," the author describes the adaptational technic and compares it with the chief therapeutic ideas evolved in the past. Future problems include the pressing social need for trouble-shooting and easing methods of treatment. The physician's emotional needs and their impact upon treatment should also be explored. The author regards this as a neglected chapter of inquiry.

The "Dynamics and Classification of Disordered Behavior" (1953) presents the author's own psychiatric nomenclature. This unfortunately adds little but confusion to the newest standard nomenclature of the American Psychiatric Association which was introduced at about the same time. Although the terminology differs, the underlying thinking appears very similar.

In summary, this is an excellent work for the student who wishes to study present-day trends of psychoanalytic thought. The writing style is lucid, and the ideas expressed would be stimulating to anyone interested in human behavior. The book will be of especial value to psychiatrists, and a "must" for those engaged in psychoanalytic therapy.

—JOHN C. MEBANE, Maj., USAF (MC)

NEUROLOGICAL AND NEUROSURGICAL NURSING, by *C. G. de Gutierrez-Mahoney*, M. D., and *Esta Carini*, R. N., M. A. 2d edition. 565 pages; illustrated. The C. V. Mosby Co., St. Louis, Mo., 1956. Price $6.25.

The current edition of the "only textbook of its kind" deserves nothing but high praise for the authors who have most admirably achieved their purpose—that of meeting the need for effective nursing care in these specialties. A comprehensive covering of such a highly specialized field has long been needed for the nursing profession and, with the inclusion of several new chapters in this edition, the goal has been most effectively attained.

To provide an understanding of the signs and symptoms of neurologic disorders, an excellent presentation of neuroanatomy, physiology, and the related scientific principles is given in the early part of the text. Diagnostic procedures are completely discussed, and the importance of nurses' observations are emphasized throughout. The authors have successfully integrated physical, social, and emotional factors of illness in planning nursing care, as shown by their statement, "An understanding of the underlying mechanisms motivating human behavior is an essential requisite of the well-qualified nurse."

This book is strongly recommended for both students and graduate nurses. It is an excellent reference text for instructors, supervisors,

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head nurses, and especially for those who give direct nursing care to all types of patients. This book is so written as to provide the professional nurse with a wealth of information related to total patient care.

—*VERA E. THOMPSON. Lt. Comdr., NC, USN*

A Manual of the COMMON CONTAGIOUS DISEASES, by *Philip Moen Stimson*, M. D., and *Horace Louis Hodes*, M. D. 5th edition. 624 pages; 84 illustrations and 10 plates, 8 in color; 16 tables. Lea & Febiger, Philadelphia, Pa., 1956. Price $8.50.

This is an extensive volume which covers the field of common contagious diseases in a very thorough manner. The format of the book is excellent, and the complete detail makes this a superb text which should be available to all teaching personnel or physicians treating the diseases.

The first three chapters are devoted to principles of contagion, serum reactions, and the antibiotics and sulfonamides. These chapters provide an excellent refresher and ready reference for those who require it. There is a very complete summary of the common contagious diseases in table form, covering all of the pertinent points for quick reference.

The black-and-white photomicrographs are clear; the black-and-white illustrations are quite good. The color plates are superior, and the authors and the publisher are to be complimented on them.

The final chapter gives a good résumé of the general management of contagious diseases which should be made available to hospitals that provide care to these diseases.

It appears that the authors intended this book to be used as a reference in teaching and in the care of common contagious diseases. Their efforts have produced a book which should be in the hands of all physicians engaged in public health, preventive medicine, pediatrics, and teaching activities.— *THEODORE C. BEDWELL, Jr., Col., USAF (MC)*

HANDBOOK OF PEDIATRIC MEDICAL EMERGENCIES, by *Adolph G. De Sanctis*, M. D., with the collaboration of *Charles Varga*, M. D., and 10 contributors. 2d edition. 389 pages; 73 illustrations. The C. V. Mosby Co., St. Louis, Mo., 1956. Price $6.25.

The second edition of this handbook has been largely rewritten and has been expanded to include new chapters on metabolic emergencies, accident and poison prevention, genito-urinary emergencies, and respiratory paralysis in poliomyelitis.

This is a compact, well-written, and intensely practical handbook for all physicians treating children. The sole purpose of this book is to outline sound therapeutic advice to guide the physician in handling emergency pediatric problems. It is not meant to be a complete text of pediatrics but a reliable guide for the physician facing a pediatric problem requiring rapid emergency therapy.

The authors have succeeded admirably in their purpose, for the earlier edition of this book has been enthusiastically received not only in

the United States but also in many foreign countries. The chapters are short and succinct, and suggest readily available therapeutic agents of life-saving importance in treating the emergencies described. The authors cover not only the common serious emergencies, but also many less serious, though still troublesome, emergencies such as insect bites, toothache, epistaxis, hiccough, frostbite, and sunburn.

The text is well organized and is supplemented with a comprehensive and well-organized index—a must for a book such as this. This book is highly recommended for any physician caring for children.

—THOMAS E. CONE, Jr., Capt., MC, USN

PROGRESS IN PSYCHOTHERAPY, 1956, edited by *Frieda Fromm-Reichmann*, M. D., and *J. L. Moreno*, M. D. 352 pages. Grune & Stratton, Inc., New York, N. Y., 1956. Price $8.50.

This volume is the publication in book form of the papers presented at the meeting of the American Psychiatric Association in Atlantic City 1955. To these there have been added brief surveys of the field of psychotherapy in Austria, Great Britain, France, Germany, South America, and Switzerland.

One hundred and forty-two different technics are mentioned in all, from the psychodrama of Moreno and existential analysis, to autogenic training and multiple therapy of Whitaker. More than forty psychotherapists from many parts of the world contributed to the volume. While the descriptions of some of the technics are necessarily brief, yet the editors do succeed in giving the reader an easy opportunity to compare different philosophies and methods.

The book points out quite clearly that psychotherapy is not a science, and that no technic can claim superior results. It suggests that the personality of the therapist may be the most important fact. Moreno states bluntly that "The personality of the therapist is the skill." The book is heartily recommended for residents in psychiatry in particular, and to all those who wish to have a quick glance at the various types of psychotherapy.—*JAY F. TUTTLE, Lt. Col., MC, USA*

THE YEAR BOOK OF PATHOLOGY AND CLINICAL PATHOLOGY (1955-1956 Year Book Series), edited by *William B. Wartman*, M. D. 480 pages; illustrated. The Year Book Publishers, Inc., Chicago, Ill., 1956. Price $6.50.

This yearbook, similar to its predecessors, summarizes concisely the important literature of pathology for the year 1955. The format of the volume is essentially the same as in previous years; that is, the book is divided into two main sections, pathology and clinical pathology, with further subdivisions into the main categories of these disciplines. The introduction, stating how the volume is compiled, demonstrates the huge amount of literature covered.

The editor has again done a fine job in condensing a large volume of material and presenting it in a lucid, readable style, with the addition of other references. Editorial comments throughout the book are par-

ticularly valuable, indicating the significance of the article and relationships to both past and present work. The illustrations and graphs frequently add to the usefulness of the text. While there are occasional typographical errors, they do not detract from the value of the book as the context is always clear. The book is invaluable as a ready reference and review of the literature. It is highly recommended to pathologists as well as to physicians in general. —*HOWARD A. VAN AUKEN, Col., MC, USA*

THE ACCIDENT SYNDROME, The Genesis of Accidental Injury, A Clinical Approach, by *Morris S. Schulzinger*, M. A., M. D. 234 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1956. Price $6.50.

This book is based on data collected from 35,000 consecutive accident cases seen by the author over a period of 20 years. Because of his interest in the circumstances surrounding each accident and in the patients' emotions and past history, his data is unusually illuminating.

Throughout the book the importance of more medical interest in accident prevention is stressed, and the arguments are very convincing. The major findings and conclusions are contained in the second chapter. This departure from more orthodox organization is not objectionable and serves to develop more reader interest. The third chapter deals with concepts of accident causation and proves to be an excellent presentation of previous work on the emotional aspects of accident causation.

The author's data confirms many previously formulated ideas on accident-causation, presenting the concept of the accident syndrome. He indicates the possibility of predicting, with reasonable certainty, when, to whom, and under what circumstances, an accident is most likely to occur. The widely accepted theory which attributes most accidents to a small, fixed group of accident-prone individuals is challenged by the author's data, which indicates that this small group of accident-prone individuals is constantly changing.

This book should be of value to physicians in general, but particularly to those treating accident cases and to the psychiatrist.

—*JAMES J. GIBBS, Maj., MC, USA*

INFANT METABOLISM, Proceedings of the World Health Organization's Seminars Held at Leyden and Stockholm in October-November, 1950, conducted by *Evert Gorter, S. Z. Levine,* and *Arvid Wallgren.* Edited by *I. Herbert Scheinberg.* 435 pages; illustrated. The Macmillan Co., New York, N. Y., 1956.

The purpose of these seminars was to bring together a group of leading medical investigators with special interest in the broad fields of infant metabolism so that scientific information might be exchanged on a research level among countries where such studies were currently in progress. Nine countries and 21 universities were represented. In broad terms, the theme of the two seminars was similar and embraced current physiological, biochemical, nutritional, and clinical problems in infant metabolism. The topics reviewed in individual panels are presented as separate chapters in the volume.

The panel on water and electrolyte metabolism dealt mainly with the role of sodium and potassium. The role of the steroids and other hormones in water balance was only briefly discussed, while the panel on metabolism in premature infants was very interesting. The studies on fat metabolism lead to contradictory results, as authorities from various countries could not substantiate each other.

The discussions of metal, vitamin, and protein metabolism are mainly concerned with experimental information and have little value to the practicing pediatrician. Variable basal metabolic rates were obtained in children under four years of age, and it was concluded that there is still little that is known of basal metabolism in infants.

This publication is not for the general practicing pediatrician, but is a valuable reference book for one interested in research in metabolism. It has little or no bibliography and is of little value as a source book.

— *WILLIAM I. NEIKIRK, Comdr., MC, USN*

COLLECTED PAPERS OF THE MAYO CLINIC AND THE MAYO FOUNDATION, edited by *Richard M. Hewitt*, M. A., M. D.; *John R. Miner*, Sc. D.; *James R. Eckman*, M. A., Ph. D.; *M. Katharine Smith*, B. A.; *Carl M. Gambill*, M. D., M. P. H.; *Florence Schmidt*, B. S. E.; and *George G. Stilwell*, M. D. Volume XLVII, 1955. 791 pages; illustrated. W. B. Saunders Co., Philadelphia, Pa., 1956.

This volume is a compilation of the publications from the Mayo Clinic and the Mayo Foundation from 1 December 1954 through 30 November 1955. It is comprised of 137 articles, presented in full, in abridged form, or in abstract, that were selected from a total of 734 papers. Bibliographies of the unpublished papers appear at the end of appropriate sections. The editorial staff has selected for inclusion an outstanding group of papers. Some deal with the present activities in the Mayo Clinic, describing recent efforts and advances. This is particularly true of the first section, devoted to "Surgery of the Heart and Blood Vessels with Special Reference to the Extracorporeal Bypass Pump Oxygenator." Other papers reflect the vast experience of the Clinic in selected disease states. The photographs, charts, drawings, and graphs liberally used by some of the authors are excellent in their conception and clear in reproduction.

The papers represented and those listed by title only are divided into 13 main groups. Those recorded by title only are presented alphabetically by author, together with the subject and the medium wherein it is published. A complete listing is repeated at the end of the book. The subject index at the end of the book covers the contents of the published papers, but unfortunately does not cover the papers listed by title only.

This annual presentation of the accomplishments of this famous Clinic and Foundation is of great value to all physicians regardless of their special interests. It is a must for medical libraries.

—*PAUL S. FANCHER, Col., MC, USA*

CYTOLOGY OF THE BLOOD AND BLOOD-FORMING ORGANS, by *Marcel Bessis*, M. D. Translated by *Eric Ponder*, M. D. 629 pages; 427 illustrations, including 22 full-color plates. Grune & Stratton, Inc., New York, N. Y., 1956. Price $22.

Workers in the field of hematology will appreciate Marcel Bessis' book, which deals principally with the study of blood cells in their living state and of their ultrastructure, utilizing the latest methods and technics, including electron and phase microscopy. It brings together much reliable information about recent advances in hematologic technics. The contents cover 15 chapters divided into three parts.

This book is up-to-date, and the coverage of the literature is adequate as each chapter has an excellent bibliography which is truly international in character. It is printed on good paper with large, readable type. The text is profusely illustrated with color plates and many remarkable photomicrographs of living cells made with phase microscopic technics, as well as those of fixed blood cells made with electron microscopic technics.

This reviewer was very favorably impressed by the readability of the book and with its clarity and elegance—an accomplishment in a large measure attributable to the excellent translation by Dr. Ponder. Here, available in English, is a volume that should be widely read especially by those seeking information and orientation in the rapidly developing field of hematology. It can be recommended for reading or reference to the clinical pathologist and the internist as well.

—*CHARLES J. FARINACCI, Col., MC, USA*

A NEW PSYCHOTHERAPY IN SCHIZOPHRENIA, Relief of Frustrations by Symbolic Realization, by *Marguerite Sechehaye*, translated by *Grace Rubin-Rabson*, Ph. D. 199 pages. Grune & Stratton, Inc., New York, N. Y., 1956. Price $4.50.

The treatment of schizophrenia by psychological means is always an interesting subject, and in recent years a number of books have been written using various approaches, each attempting to point the way.

This book is a translation of a series of lectures given to the medical staff of the Bürgholzli Psychiatric Clinic in Switzerland by Mme. Sechehaye. Her method is called "symbolic realization" and is described as "a therapy aimed directly at the needs and frustrations endured in childhood to fulfill and satisfy them on the presymbolic magic and concrete level." In formulating the method of therapy she draws heavily upon psychoanalytic and existentialist concepts as well as on genetic psychology. However, the necessity of using ordinary psychiatric technics, such as an adequate history and questioning of relatives, is emphasized. The constitutional factor is not underestimated, and in certain cases strictly organic therapy may be employed to facilitate contact with the patient.

Schizophrenic symptoms are carefully analyzed and are divided into four categories: first, those manifestations directly expressing the

psychotic experiences; second, those expressing negative reactions to frustrations such as aggression, guilt, and anxiety; third, those expressing positive reactions to frustrations, or compensations, as seen typically in paranoia; and fourth, those expressing the needs themselves in symbolic forms.

Divining and satisfying these needs in the appropriate fashion is the task of the therapist. This may even take the form of permitting the patient to play the part of an infant—to take milk by bottle or obtain other satisfactions of early life either in direct or symbolic form, depending on the level of regression. Mme. Sechehaye discusses the various problems involved and draws heavily on the case of Renee, a schizophrenic whom she treated successfully by this method. She does not claim her method is a panacea for schizophrenia, and emphasizes the difficulties involved. The book is provocative and stimulating, but not easy reading. It should be of interest to any psychiatrist treating psychotic patients.—*JAY F. TUTTLE, Lt. Col., MC, USA*

ORAL CANCER AND TUMORS OF THE JAWS, by *George S. Sharp,* M. D.; *Weldon K. Bullock,* M. D., M. Sc. (Path.); and *John W. Hazlet,* D. D. S. 560 pages; illustrated. The Blakiston Division, McGraw-Hill Book Co., Inc., New York, N. Y., 1956. Price $15.

This is the first edition of a book concerned with the clinical diagnosis of oral cancer and collaborated on by a surgeon, a pathologist, and a specialist in oral cancer diagnosis. By the authors' own admission, this is not a textbook but a syllabus for the oral diagnostician.

The basic organization of the material is good, and the initial inclusion of chapters on the history of cancer, the origin of cancer, classifications of oral neoplasms, a discussion of biopsy procedures, and a brief discussion of precancerous lesions will be an aid and a review to the clinician.

The text is generally well written; however, a few statements are made and terms used which are debatable or open to question. The small paragraph devoted to the so-called retinal anlage tumor leaves the reader with the impression that the retinal origin is relatively well established. This tumor is considered by some pathologists as odontogenic in origin. The introduction of the term "odontic" is unfortunate since the use of "odontogenic" is acceptable and well-imbedded in the literature. The discussion of the pathogenesis of ameloblastomas with emphasis upon the basal-cell theory of origin might be questioned by many oral pathologists, especially in the United States.

The great value of the volume lies in the multitude of excellent illustrations. Especially worthy of note is the high degree of technical proficiency used in the preparation of the roentgenograms for printing. This book will be of value to all practicing dentists, especially periodontists and oral surgeons. Physicians who are concerned in their practice with the diagnosis and treatment of oral lesions, especially neoplasms, will also find this book useful.—*WILLIAM G. SPRAGUE, Capt., USAF (DC)*

CLINICAL SELECTIONS IN DERMATOLOGY AND MYCOLOGY, by *Frederick Rehm Schmidt,* M. D., with contributions by 36 specialists from various lands. 505 pages. Charles C Thomas, Publisher, Springfield, Ill., 1956. Price $10.50.

As its title implies, this book is made up of selected readings on many varied subjects in the fields of dermatology and mycology. Dr. Schmidt, the author of 14 chapters, has edited the other 29 chapters contributed by 36 specialists, mostly physicians and scientists of the various American countries. Many of the chapters are excellent, having been written by authorities on the particular disease or subject under discussion. Their writings reflect excellent first-hand observations and concise reporting. A few chapters, however, are too superficial and brief in the handling of the subject matter, and therefore of limited value.

The relationship of climate, personal hygiene, environment, and diet in the diseases considered is frequently discussed. Much can be learned from this book about dermatologic conditions or diseases with dermatologic manifestations which are uncommon in the United States. Treatment of the diseases where applicable is discussed in a logical and concise manner, using, whenever possible, drugs which are universally available. A number of controversial opinions and original ideas are expressed, and these will prove stimulating and thought provoking for the seasoned dermatologic reader.

This book is well written and well edited, and covers many subjects in an interesting and informative manner. It should be read by all dermatologists and by other physicians interested in one or more of the discussed diseases, and belongs in all medical reference libraries.

—*JOHN W. ALBRITTAIN, Capt., MC, USN*

OF RESEARCH PEOPLE, by *George E. Burch,* M. D., F. A. C. P. 56 pages; illustrated. Grune & Stratton, Inc., New York, N. Y., 1955. Price $3.

This is a short book of 56 pages. The cryptic duties of the galaxy of "research people" from the responsible investigator to the dishwashers are presented in terse description and pointed caricature.

Dr. Burch describes the true investigator as one with the ability to make discoveries, and differentiates between the scientists who "rediscover" and the individuals who provide a new or different application or development. His contention that "discoveries are made by a rare man, development by many" will be accepted by the majority of researchers. However, his opinion that the best research is accomplished in the laboratory by an able investigator, either alone or with the assistance of not more than one or two competent technicians, and that the quality of research tends to vary inversely with the number of assistants will be seriously questioned by many investigators. Many can cite instances where team work by several individuals employing many scientific disciplines were able to obtain the solution to a problem that would have remained unsolved by the efforts of a single investigator.

Undoubtedly, the people engaged in research activities as portrayed by Dr. Burch exist and, by the same token, do not represent the ideal researcher. Many other individuals who devote their energies to exploring the unknown will derive keen and quiet enjoyment from a perusal of this book, which is cleverly illustrated in a sophisticated, frank, and severely critical manner.—*TYRON E. HUBER, Col., MC, USA*

DIAGNOSIS AND TREATMENT OF VASCULAR DISORDERS (ANGIOLOGY), edited by *Saul S. Samuels*, A. M., M. D., with 17 contributors. 621 pages; illustrated. The Williams & Wilkins Co., Baltimore, Md., 1956. Price $6.

The editor of this volume has called upon the extensive knowledge and experience of 17 contributors who have written 21 of the 24 chapters. Each is a nationally known authority in his specialty; these range from anatomy, physiology, internal medicine, and surgery to physical medicine.

With the exception of the chapter on the anatomy of the peripheral circulation, which necessarily is brief, all of the subjects are covered in a very comprehensive manner. Of extreme interest to the diagnostician is the section on examination of the patient, which includes not only the various ramifications of the history and physical examination but the invaluable laboratory methods of investigation. Prominent among these is the discussion on plethysmography. In addition to the numerous conditions treated primarily by medical methods, the newer concepts in the surgical management of aneurysms, fistulae, acute arterial trauma, and aortic lesions are adequately presented. An informative chapter on anticoagulant therapy is also included.

Each chapter has an extensive bibliography for those who wish to further investigate vascular disorders, and the text abounds with excellent illustrative charts and photographs. A prime example of this is the chapter on angiography.

It is believed that this book could profitably be read by all internists and surgeons who may be confronted with vascular problems. It would also make an authoritative addition to the library of those particularly interested in the entire subject of angiology, which includes both medical and surgical components of vascular disorders.

—*EDWARD J. JAHNKE, Jr., Maj., MC, USA*

TEXTBOOK OF UROLOGY, By *Victor* F. *Marshall*, M. D. 268 pages; illustrated. Paul B. Hoeber, Inc., Medical Book Dept. of Harper & Bros., New York, N. Y., 1956. Price $5.50.

This book was developed from 20 formal lectures given to third-year medical students by various lecturers and revised by the author. It is relatively small in size when compared with most of such texts. A short history of urology is given in a clear and concise manner which includes an excellent summary of the various methods, including laboratory tests, to be employed in the performance of urologic investigations. Each of the chapters contains simple, succinct, yet complete sections on the

embryology and anatomy of the part or parts under discussion. The last chapter covers the important principles and technical details of urologic surgery.

The book is profusely illustrated in a manner that can be easily understood by individuals not trained in urology, yet the illustrations are uniformly of the highest degree of accuracy, and, when indicated, sufficiently detailed to be of value to trained urologists. It was intended as a text for undergraduate medical students and as such, in my opinion, is by far the best such text published to date. However, it is also a text that should be part of the library of every urologist because, even though short in length and simple in style, it contains many useful procedures and conclusions that exemplify a vast amount of urologic experience and excellent clinical judgment. It should be a "must" in the reading of all residents who are to receive any training in urology.

—MARK S. CURTIS, Capt., MC, USN

ELECTRODIAGNOSIS AND ELECTROMYOGRAPHY, edited by *Sidney Licht*, M. D. Volume One of Physical Medicine Library. 272 pages; 90 figures. Elizabeth Licht, Publishers, New Haven, Conn., 1956. Price $10.

This book, which the editor states is the first ever written covering both the subjects of electrodiagnosis and electromyography, is multi-authored and was prepared by 12 authors, all of them physicians.

There are 10 chapters covering history, apparatus, physiology, motor points, routine electrodiagnosis, chronaxy, strength-duration curves, progressive and alternating currents, electromyography, and electrical skin response.

The authors review the basic electronics of the instrumentation and discuss this application in the various electrodiagnostic tests used in the modern study of peripheral nerve and muscle disorders. The novice in electronics may find the physics somewhat detailed, but most will find that the review of these principles helps recall basic information learned in medical school and college.

The clinician who has grown accustomed to requesting the various diagnostic procedures without too much first-hand knowledge of the tests will find this an excellent review. The physician who has not learned to use electrical tests for diagnosis will find this an informative introduction to a useful armamentarium for his diagnostic kit.

As in any multi-authored book, there is some repetition from chapter to chapter; however, this is not excessive. There are many useful diagrams which help explain the basic principles of the instruments and the physiology and characteristic findings in the various clinical disorders.

The book will be most useful for the neurologist, neurosurgeon, psychiatrist, internist, and orthopedist.

—ROBERT L. WILLIAMS, Maj., USAF (MC)

SELECTED PAPERS ON PSYCHO-ANALYSIS, Volume I: On the Early Development of Mind, by *Edward Glover*, M. D. 483 pages. International Universities Press, Inc., New York, N. Y., 1956. Price $7.50.

In his inimitable literary style, which has both clarity and picturesque imagery, Dr. Glover presents in this collection of selected papers on psychoanalysis a very worthwhile study of the early development of the mental and emotional processes of the human individual. While the book requires a basic understanding of psychoanalytic principles and concepts, it serves to unite many of these concepts and principles into a more usable form. Particularly impressive are the scientific standards which Dr. Glover requires of himself and others in presenting various aspects of the science of psychoanalysis. Of particular intrest are his papers on the psychology of the psychotherapeutist, the application of psychoanalytic principles in psychiatry, research methods in psychoanalysis, and the indications for, and frontiers of, psychoanalysis. All of these papers emphasize the advances important to the future of psychoanalysis in scientific medicine.

While this volume is of most value to serious workers in psychoanalysis, whether student or analyst, it will provide many other professional students of human behavior with both scientific information and a literary masterpiece.

This is an excellent companion to Dr. Glover's book *The Techniques of Psychoanalysis*. Both books should be in the working library of professional workers in psychoanalysis.—*LUCIO E. GATTO, Col., USAF (MC)*

THE NEUROSURGICAL ALLEVIATION OF PARKINSONISM, by *Irving S. Cooper*, M. D., Ph. D. 104 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1956. Price $8.50.

This monograph clearly and concisely presents the author's technic for the alleviation of the most severe symptoms of parkinsonism by occlusion of the anterior choroidal artery and chemopallidectomy. He first reviews the problem of severe parkinsonism and the efficacy of the medical and previous surgical approaches to remedy the main symptoms of this disease. The anatomy, functions, and blood supply of the globus pallidus and its role in the parkinsonian complex are described. There is a complete review of the author's operations for occlusion of the anterior choroidal artery and chemopallidectomy, including the selection of suitable cases for each procedure, anesthesia, the importance of pre- and post-operative arteriograms, postoperative care, and the operative mortality.

Case reports of 15 patients with anterior choroidal artery occlusions and 10 patients with chemopallidectomy are presented and include many pre- and post-operative photographs. The text is also well illustrated with excellent sketches of the operative technic used.

This text is primarily intended for neurosurgeons; however, neurologists will also find the case histories and summary of marked interest.

The author should be commended for this excellent presentation of his operative material, and it is hoped that his record of 70 per cent improvement in these cases will be of a lasting nature.

—WILLIAM J. JAMES, Capt., MC, USN

BIOCHEMICAL MECHANISMS IN INFLAMMATION, by *Valy Menkin*, M. A., M. D. 2d edition, completely revised. Edited by *Edward J. Ryan*, D. D. S. 438 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1956. Price $9.50.

The second edition of this monograph on biochemical mechanisms in inflammation has been expanded and now includes observations by many investigators as well as the author. The material is presented in an integrated manner and the reader is introduced to recent facts and theories of inflammation. The author has long maintained that in inflammation the altered biochemistry of the injured cell causes the liberation of biochemical units. This theory is reviewed and examined in the light of additional data obtained by the author. New material has been added regarding the pyrogenic factor, the anti-inflammatory corticoids, and ACTH.

This book is of interest to those who wish to probe into the biochemical mechanisms of the injured cell in inflammation.

—ELSON B. HELWIG, Col., MC, USAR

COMPLETE MOUTH REHABILITATION THROUGH CROWN AND BRIDGE PROSTHODONTICS, by *Harry Kazis*, D. M. D., and *Albert J. Kazis*, D. M. D. 392 pages; 551 illustrations on 332 engravings. Lea & Febiger, Philadelphia, Pa., 1956. Price $15.

The text of this book, which is prepared in three parts, is a guide to full-mouth rehabilitation through crown and bridge prosthodontics. The first part sets forth fundamental principles, theories, and functional aspects of rehabilitation. Chapters on anatomy of the temporomandibular joint, physiology of mastication, physiologic rest position, vertical dimension, occlusion, and periodontal considerations are capably presented. The second reports 25 cases involving typical mutilated dentition problems encountered in practice. The methods and technics employed by the authors for diagnosis, planning, and treatment are discussed in each case. The third part opens with a discussion of anesthesiology in relation to crown and bridge prosthodontics, while following chapters present operative and technical factors in considerable detail. The text is concluded with a pictorial description of a technic for construction of movable-removable precision attachment partial dentures.

Excellent organization of the text and a concise manner of presentation lend themselves to easy reference and reading, while well-selected illustrations augment and clarify the text.

—ARTHUR R. FRECHETTE, Capt., DC, USN

BASIC READINGS ON THE MMPI IN PSYCHOLOGY AND MEDICINE, edited by *George Schlager Welsh* and *W. Grant Dahlstrom.* 656 pages. University of Minnesota Press, Minneapolis, Minn., 1956. Price $8.75.

The Minnesota Multiphasic Personality Inventory (MMPI) is a multivariate personality instrument which is currently one of the most widely used questionnaires and one of the best empirically constructed scales. Ever since its introduction 15 years ago a tremendous amount of effort has been expended in constructing and attempting validation not only of the original MMPI scales but also of some 100 additional scales. The editors of this collection of articles, a psychologist and psychiatrist, both members of the departments of psychology and psychiatry, have rendered a good service to students of human behavior, amateur or professional, by bringing together in book form these basic readings on the MMPI in psychology and medicine.

Of the 689 articles on the MMPI arranged in a master list in the bibliography and complete through December 1954, the editors chose 10 per cent (66 articles by 45 authors) of those they considered to be the most important as the basis of this book. Selections were difficult to make, and compromise was necessary to pick articles that would be most serviceable to psychologists and psychiatrists as well as to clinicians, research workers, and students of personality test construction and theory. Preference was given to publications having historical priority, completeness of analysis, sample representativeness, or imaginative design. Over half of the 689 MMPI items have appeared in the years since 1950. The articles chosen range over the years from 1940 through 1954 and include three original papers prepared especially for this book.

The book presents evidence of the urgent need, when using the MMPI and other diagnostic tools, for obtaining necessary validating estimates required in personality measurement. In clinical practice we find that the MMPI scale scores indicate possible areas of maladjustment by sorting profiles according to their highest abnormal T-scale scores. Users of the MMPI or its 100 other scales will find this book indispensable.—*FRANK KILLIAN, Jr., Lt. Col., USAF (MSC)*

TREATMENT OF HEART DISEASE, A Clinical Physiologic Approach, by *Harry Gross,* M. D., and *Abraham Jezer,* M. D. 549 pages; illustrated. W. B. Saunders Co., Philadelphia, Pa., 1956.

This book is different and it has a valuable place among textbooks for specialists in internal medicine and cardiology. The over-all approach is one of adapting basic information very clearly and practically to effective treatment of patients with heart disorders either in office practice or within the hospital. The book includes discussions of basic mechanisms of cardiac symptoms and management; hypertensive, inflammatory, and congenital heart disease problems; surgery in the cardiac patient; and diseases of the heart secondary to metabolic disorders. The concluding part deals realistically with the emotional problems of the patient with heart disease and his general rehabilitation in his community.

This entirely new text was written primarily for practitioners of medicine, but it includes a great deal of basic information of value to students as well as graduates in medicine. The viewpoints of other authorities and their interpretations are presented.

The double-column format of this book makes it easy to read. For the student in cardiology who desires further details, each chapter closes with a long list of references. This is not just another book but a really worthwhile contribution.

—*U. R. MERIKANGAS, Col., MC, USA*

BRITISH MEDICAL BULLETIN, Volume 12, Number 1, January 1956, "Recent Research on Vitamins." 90 pages; illustrated. Published by the Medical Dept., The British Council, London W1, England. Distributed by Oxford University Press, New York, N. Y., Jan. 1956. Price $2.75.

The January 1956 issue of the authoritative *British Medical Bulletin* is devoted to advances in vitamin research. Some of the most prominent names in British medicine are present and, in keeping with their traditions, the articles are short, clear, and pertinent. The subject matter includes the role of vitamins in vision, bones, skin, and nervous system, as well as such topics as the effects of food processing, antivitamins, and lipotropic agents. These articles serve as an excellent current survey, and as a helpful reminder that much remains to be done in the field of vitamin nutrition.—*S. O. WAIFE, Lt. Comdr., MC, USNR*

AN ATLAS OF ANATOMY, by *J. C. Boileau Grant,* M. C., M. B., Ch. B., F. R. C. S. (Edin.). 4th edition. 8½ by 11 inches in size. 556 pages; 714 figures in color, arranged in the regional manner. The Williams & Wilkins Co., Baltimore, Md., 1956. Price $15.

This atlas has earned a secure place among basic anatomy volumes, and the improvements added to this edition further enhance its value and function.

Many of the old illustrations have been improved, some enlarged, and some deleted, and there are 80 new figures. The new additions include cross sections of the limbs and neck, orbital and nasal cavities, basic diagrams of the arteries of the upper and lower limbs, and many others. Other basic diagrams clearly depict the scheme of motor distribution of the limbs, anatomic variants of the cystic duct and cystic and hepatic arteries, and variations in the pattern of the cutaneous nerves to the dorsum of the hand.

The format is simple and functional, and the index refers to figure numbers instead of pages, which directs one easily to the subject matter. The legends and footnotes include all practical facts.

This book is a one-volume atlas and as such has adapted and condensed the illustrations to adequately and concisely cover the entire field. It is not presented as a surgical anatomy. Within these limitations, this presentation has achieved its purpose and should retain a high listing among such books.—*RALPH M. MUGRAGE, Capt., MC, USN*

New Books Received

Books received by the *U. S. Armed Forces Medical Journal* are acknowledged in this department. Those of greatest interest will be selected for review in a later issue.

MANUAL OF RECOVERY ROOM CARE, by *Members of the Department of Surgery, The New York Hospital-Cornell Medical Center,* edited by *John M. Beal,* M. D. 111 pages; illustrated. The Macmillan Co., New York, N. Y., 1956. Price $3.75.

THE MERCK MANUAL of Diagnosis and Therapy, edited by *Charles E. Lyght,* M. D. 9th edition. 1,888 pages; 20 main sections, each thumb-indexed. Merck & Co., Inc., Rahway, N. J., 1956. Price $6.75.

OFFICIAL HISTORY OF THE CANADIAN MEDICAL SERVICES, 1939-1945; Volume I, Organization and Campaigns, edited by *W. R. Feasby,* B. A., M. D. 568 pages; illustrated in color with paintings and photographs by Canadian War Artists and Photographers. Maps drawn by Captain *C. C. J. Bond.* Published by Edmond Cloutier, C. M. G., A. O., D. S. P., Queen's Printer and Controller of Stationery, Ottawa, Ontario, Canada, 1956. Obtainable from the Superintendent of Government Publications, Department of Public Printing and Stationery, Ottawa, Ontario, Canada. Price $5 postpaid.

ANNALS OF THE RHEUMATIC DISEASES, Volume 15, No. 3, September 1956. Editor, *W. S. C. Copeman*; assistant editor, *Oswald Savage.* 84 pages; illustrated. Published by British Medical Association, Tavistock Square, London W. C. 1, England. Price $7, yearly subscription (4 numbers); $2.25 single numbers.

SIMPLIFIED NURSING, by *Florence Dakin,* R. N., and *Ella M. Thompson,* B. S., R. N., with the assistance of *Margaret LeBaron,* R. N. 6th edition. 800 pages; illustrated. J. B. Lippincott Co., Philadelphia, Pa., 1956. price $4.50.

THE IMAGE OF THE HEART, And the Principle of Synergy in the Human Mind, by *Daniel E. Schneider,* M. D. 267 pages. International Universities Press, Inc., New York, N. Y., 1956. Price $6.

TEACHING NUTRITION IN NURSING, by *Henderika J. Rynbergen, B. S.,* M. D. 4th edition. 142 pages. J. B. Lippincott Co., Philadelphia, Pa., 1956. Price $2.75.

UROLOGY AND INDUSTRY, by *Leonard Paul Wershub,* M. D., F. A. C. S., F. I. C. S., D-I. C. S., D-U. 151 pages. Charles C Thomas, Publisher, Springfield, Ill., 1956. Price $5.

SICK CHILDREN, Diagnosis and Treatment, by *Donald Paterson,* M.D. (Edin.), F. R. C. P. (Lond.), F. R. C. P. (Canada). Revised by *Reginald Lightwood,* M. D. (Lond.), F. R. C. P. (Lond.), D. P. H. (Eng.), with the assistance of *F. S. W. Brimblecombe,* M.D. (Lond.), M. R. C. P. (Lond.), D. C. H. 7th edition. 593 pages; illustrated. J. B. Lippincott Co., Philadelphia, Pa., 1956. Price $8.75.

HANDBOOK OF BIOLOGICAL DATA, edited by *William S. Spector.* Prepared under the Direction of the Committee on the Handbook of Biological Data, Division of Biology and Agriculture, The National Academy of Sciences, The National Research Council. 584 pages; illustrated. W. B. Saunders Co., Philadelphia, Pa., 1956.

PEDIATRICS, edited by *Donald Paterson,* M. D., and *John Ferguson McCreary,* M.D., with 36 contributing authors. 654 pages; illustrated. J. B. Lippincott Co., Philadelphia, Pa., 1956. Price $14.

MANAGEMENT OF EMOTIONAL PROBLEMS IN MEDICAL PRACTICE, edited by *Sameul Liebman,* M. D. 152 pages. J. B. Lippincott Co. Philadelphia, Pa., 1956. Price $5.

PHARMACOGNOSY, The Study of Natural Drug Substances and Certain Allied Products, by *Robertson Pratt,* Ph. D., and *Heber W. Youngken, Jr.,* Ph. D. 2d edition. 694 pages; 70 illustrations including 3 plates in full color. J. B. Lippincott Co., Philadelphia, Pa., 1956. Price $10.

PRACTICAL PEDIATRIC DERMATOLOGY, by *Morris Leider,* M.D. 433 pages; 280 photographs and 13 drawings. The C. V. Mosby Co., St. Louis, Mo., 1956. Price $10.50.

HEAD INJURIES AND THEIR MANAGEMENT, by *Francis Asbury Echlin,* M. D., C. M., M. Sc., Med. Sc. D., F. A. C. S. 127 pages; illustrated. J. B. Lippincott Co., Philadelphia, Pa., 1956. Price $3.

CLINICAL UNIPOLAR ELECTROCARDIOGRAPHY, by *Bernard S. Lipman,* A. B., M. D., F. A. C. P., and *Edward Massie,* A. B., M. D., F. A. C. P. 3d edition. 397 pages; illustrated. The Year Book Publishers, Inc., Chicago, Ill., 1956. Price $7.50.

THE PERSON BEHIND THE DISEASE, by *Julius Bauer,* M. D., F. A. C. P. 136 pages. Grune & Stratton, Inc., New York, N. Y., 1956. Price $3.50.

COMPARATIVE ANATOMY OF THE EYE, by *Jack H. Prince,* F. B. O. A., F. S. M. C., F. R. M. S., F. Z. S. (London). 418 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1956. Price $8.50.

PROSTHETIC DENTISTRY, A Clinical outline, by *F. Winston Craddock,* B. A., Dip. Ed., M. S. D., D. D. S. 430 pages; 201 illustrations. 3d edition. Henry Kimptom, 24 Bloomsbury Way, London W. C. 1, England, 1956. Price $6.

PRE AND POST OPERATIVE CARE IN THE PEDIATRIC SURGICAL PATIENT, edited by *William B. Kiesewetter,* M. D. 347 pages; illustrated. The Year Book Publishers, Inc., Chicago, Ill., 1956. Price $7.

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